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**Chrysopidae of Canada and Alaska (Insecta, Neuroptera):  
revised checklist, new and noteworthy records, and  
geo-referenced localities**

J.A. GARLAND & D.K. MCE. KEVAN (POSTHUMOUS)



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## Chrysopidae of Canada and Alaska (Insecta, Neuroptera) : revised checklist, new and noteworthy records, and geo-referenced localities

J.A. GARLAND<sup>1</sup> & D.K. MCE. KEVAN<sup>2</sup>

<sup>1</sup>McGill University, Macdonald Campus, 21,111 Lakeshore Road, Ste-Anne-de-Bellevue, Quebec H9X 3V9. Present Address: Canadian Food Inspection Agency, 3851 Fallowfield Road, Ottawa, Ontario K2H 8P9. E-mail: garlandj@inspection.gc.ca

<sup>2</sup>Posthumous. Deceased: July 9, 1991, Canada

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## Abstract

The Chrysopidae of Canada and Alaska, the subject of a study since 1980, including more than 6,000 adults representing 24 species in two subfamilies, are here revised and the localities geo-referenced. The number of specimens, earliest authenticated specimen, new records, flight period, and the localities supported by museum specimens are provided for each species for each province or territory of Canada, as well as the State of Alaska, USA. Localities in literature for which no specimen exists are queried. A directory of collectors is provided. Biological attributes, such as attraction to light, and plants or habitat where specimens were collected, are based on label data. *Chrysopa quadripunctata* Burmeister and *Chrysoperla rufilabris* (Burmeister) are reported for the first time from the Province of Manitoba, Canada; and, *Meleoma emuncta* (Fitch), for the first time from the provinces of Alberta and Saskatchewan, Canada. Nomenclatural changes include: *Mallada slossonae* Garland, 1996, as a new objective synonym of *Dichochrysa macleodi* (Adams and Garland, 1983; *Mallada*) **syn. nov.**, and *Dichochrysa perfecta* (Banks, 1895), an **emendation**.

**Key words:** Neuroptera, Chrysopidae, Canada, Alaska

## Résumé

Les Chrysopidae du Canada et de l'Alaska, le sujet d'une étude depuis 1980, y compris plus de six mille spécimens adultes représentant 24 espèces dans deux sous-familles, sont ici mis à jour et les localités mises en référence géographique. Pour chaque espèce dans chaque province ou territoire du Canada, aussi bien que l'état de l'Alaska, les États-Unis, on trouvera le nombre de spécimens, le spécimen authentifié le plus tôt, les nouvelles récoltes, les dates extrêmes de récolte, et les localités de récolte soutenues par des spécimens de musée. Des localités en littérature pour laquelle aucun spécimen n'existe sont indiquées. Ce travail fournit un annuaire de collecteurs. Des attributs biologiques, soit l'attraction à la lumière, soit les plantes-hôtes ou l'habitat où des spécimens ont été rassemblés, sont basés sur des données d'étiquette. Les espèces *Chrysopa quadripunctata* Burmeister et *Chrysoperla rufilabris* (Burmeister) sont signalées pour la première fois de la Province de Manitoba, Canada; et l'espèce *Meleoma emuncta* (Fitch), est signalée pour la première fois des provinces d'Alberta et de Saskatchewan, Canada. Des changements nomenclatural incluent : *Mallada slossonae* Garland, 1996, comme un nouveau synonyme objectif de l'espèce *Dichochrysa macleodi* (Adams and Garland, 1983; *Mallada*) **syn. nov.**, et *Dichochrysa perfecta* (Banks, 1895), comme une **emendation**.

## Introduction

The study of green lacewings or Chrysopidae in Canada can be traced in literature for 150 years, or more, starting with Gosse (1840 [1971]<sup>1</sup>). The first mention of Chrysopidae in Alaska was by Bickley and MacLeod (1956). Early specimens from British North America deposited at the British Museum, according to Walker (1853), could not be located. Such early specimens that do exist either lack context, i.e., there are no labels pinned with the specimens, or they lack the label data that has become standard (Wheeler *et al.* 2001). By the early 1900's, the practice had developed of documenting new records, including Neuroptera *sensu lato*, in Annual Reports of the Entomological Society of Ontario, e.g., Gibson 1910, and of retaining voucher specimens in Ottawa or sending them to specialists for identification. Thus, many Canadian first records are deposited at the Museum of Comparative Zoology at Harvard University. Also during this period, the United States Museum of Natural History made collecting excursions into Canada (Currie 1904; Dyar 1904; Flint 2002). Some years later, interest in biological control led to collections in the interior of British Columbia (Dennys 1927). Also, the chrysopid fauna of Canada was analysed for the first time (Smith 1932); collecting excursions were made to Timagami, Ontario, in 1932 (A.W.A. Brown 1934), and to insular Newfoundland in 1949 (Krogerus 1954; Lindroth 1957); and the chrysopid fauna of neighbouring countries became better known, e.g., Greenland (Carpenter 1938; Henriksen 1939), Iceland (Frstrup 1942), the United Kingdom (Barnard 1978), and the former USSR (Dorokhova 1979). In 1977, the Biological Survey of Canada was inaugurated (Danks 1979). At that time, it was thought that Chrysopidae in Canada numbered about 25 species, and that some of them probably extended as far north as tree-line (Kevan 1979).

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1. Facsimile reprint, Coles Publishing Co., Toronto. 1971.

The scope of this study was to provide a systematic framework for the Chrysopidae of Canada and Alaska. To date, recent study of the Chrysopidae of Canada and Alaska has generated a taxonomic analysis complete with keys, label data, figures, distribution dot-maps, and synonymy pertaining to Canada and Alaska up to August 1981 (Garland 1982 [1984]<sup>2</sup>); a preliminary checklist and nomenclatural changes (Garland 1984, 1985c); diagnostic keys for the identification of the genera and species, and bionomic notes in literature pertaining to six species (Garland 1985a); designation of a neotype for one species (Garland 1985b); descriptions of two new species (Adams and Garland 1981, 1982); an in-depth analysis of seasonal adaptations and life history traits for populations of the *carnea*-group at diverse locations in the USA, including Alaska, and Manitoba, Canada (C.A. Tauber and Tauber 1982); a comparative study of dormancy in one species at diverse locations in the USA and Manitoba, Canada (Nechols *et al.* 1987); phenology of the *carnea*-group at the northern limits of its range in Canada (Garland 1989); supplementary label data mainly from British Columbia and Yukon (Garland 2000); and rediscovery of one species that was last collected in 1908 in British Columbia (Garland 2001). Chrysopidae are now known to include 24 species in two subfamilies in Canada, and three species in one subfamily in Alaska (Garland 1985a), and one species has been collected far beyond the tree-line in northern Canada (Garland 1989).

The present contribution provides a revised checklist, new and noteworthy records, and geo-referenced localities for the Chrysopidae of Canada and Alaska.

## Material and methods

This study is based on an examination of museum specimens from 48 institutional collections, and one personal collection. In Canada, questionnaires were sent out in mid-1977 to entomological establishments, certain other organisations and individuals thought to have collections of arthropod material; in the United States, institutions with holdings of Canadian insects were provided by the Association of Systematics Collections; in Europe, major museums in most countries were contacted to ascertain the whereabouts of any Canadian material (Anonymous 1978). Abbreviations for the institutions are those employed by Garland (1982 [1984], 2000), to facilitate cross-referencing. The directory of collectors in Garland (1982 [1984]) is updated to include the names of collectors of specimens examined since 1982. First records for each species are based on authenticated specimens for each province or territory of Canada, and for the State of Alaska. New records are cited with the complete label data pinned with the specimen. Coordinates for geo-referencing of Canadian localities were obtained from Natural Resources Canada<sup>3</sup>; for Alaskan localities, *The Times Atlas of the World* (4<sup>th</sup> edition 1985). Distributional and other data were obtained from labels pinned with the specimens. A catalogue of specimen label data and correspondence pertaining to this study up to August 1981, is available at the Lyman Entomological Museum and Research Laboratory, McGill University. A short supplement to that catalogue was published in 2000 (Garland 2000).

### Institutional collections<sup>4</sup>

APM	Algonquin Park Museum, Ontario Ministry of Natural Resources, Whitney, Ontario; Mr. R.G. Tozer
BCPM	British Columbia Provincial Museum [now Royal British Columbia Museum], Victoria, British Columbia; Mr. R.A. Cannings
BMNH	British Museum (Natural History) [now The Natural History Museum], London, England; Dr. P.C. Barnard

2. ISBN: 0315101962. National Library of Canada. 1984.

3. Natural Resources Canada. Available from: <http://geonames.nrcan.gc.ca/> (October 2006)

4. In: *Collections of Canadian Insects and Certain Related Groups*, 1978. The Entomological Society of Canada, Bulletin 10(1), Supplement. Cited as: Anonymous 1978.

CARS	Charlottetown Agriculture Research Station, Agriculture and Agri-Food Canada, Charlottetown, Prince Edward Island; Dr. L.S. Thompson
CAS	California Academy of Sciences, San Francisco, California; Dr. P.H. Arnaud, Jr.
CNC	Canadian National Collection of Insects, Arachnids, and Nematodes, K.W. Neatby Building, Agriculture and Agri-Food Canada, Ottawa, Ontario; Mr. J.E.H. Martin, Dr. J.T. Troubridge; [visited; also on location, 2005]
CRFL	Centre de Recherches Forestière des Laurentides, Environnement Canada [Centre de foresterie des Laurentides, Ressources Naturelles Canada], Sainte-Foy, Québec; Mr. J.-P. Laplante
CSQ	Complexe Scientifique du Québec, Collection d'insectes, Ministère des Ressources naturelles et de la Faune du Québec, Sainte-Foy, Québec; Mr. G. Bonneau; [visited]
CU	Cornell University, Ithaca, New York, USA; Dr. L.L. Pechuman
GLFRC	Great Lakes Forest Research Centre [now Great Lakes Forestry Centre], Natural Resources Canada, Sault Ste. Marie, Ontario; Mr. P.D. Syme
IHTN	Indian Head Tree Nursery, Prairie Farm Rehabilitation Administration, Agriculture and Agri-Food Canada, Indian Head, Saskatchewan; Mr. G.B. Neill
JEC	James Entomological Collection, Washington State University, Pullman, Washington; Dr. R.S. Zack
KARS	Kentville Agriculture Research Station, Agriculture and Agri-Food Canada, Kentville, Nova Scotia; Dr. A.W. MacPhee
KSU	Kansas State University, Manhattan, Kansas; Dr. H.D. Blocker
LCCU	Loyola Campus of Concordia University, Biology Department, Montréal, Québec; Dr. P.J. Albert
LEM	Lyman Entomological Museum and Research Laboratory, Macdonald College of McGill University, Ste-Anne-de-Bellevue, Québec; Dr. V.R. Vickery, Ms. S. Boucher, Mr. H. Varady-Szabo; [on location, 1974–1982]
MCMU	McMaster University, Biology Department, Hamilton, Ontario; Dr. D.M. Davies
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts; Miss S.M. Foster, Miss Mary Hathway, Mr. N.D. Stone; [visited]
MFRC	Maritimes Forest Research Centre, Environment Canada [now Atlantic Forestry Centre, Natural Resources Canada], Fredericton, New Brunswick; Mr. F.A. Titus
MMMN	Manitoba Museum of Man and Nature, Winnipeg, Manitoba; Dr. W.B. McKillop
MU	Memorial University, Biology Department, St. Johns, Newfoundland, Canada; Dr. D.J. Larson
NDFRC	Newfoundland Forest Research Centre, Environment Canada, St. John's [now Atlantic Forestry Centre, Natural Resources Canada, Corner Brook], Newfoundland and Labrador; Mr. K.E. Pardy
NFRC	Northern Forest Research Centre, Environment Canada [now Northern Forestry Centre, Natural Resources Canada], Edmonton, Alberta; Dr. H.R. Wong, Mr. G.R. Pohl
NSM	Nova Scotia Museum, Halifax, Nova Scotia; Mr. B. Wright
PFRC	Pacific Forest Research Centre, Environment Canada [now Pacific Forestry Centre, Natural Resources Canada], Victoria, British Columbia; Miss E. Pass
PIDAA	Plant Industry Division, Alberta Agriculture, Edmonton, Alberta; Dr. M.Y. Steiner
RARS	Regina Agriculture Research Station, Agriculture and Agri-Food Canada, Regina, Saskatchewan; Dr. M.G. Maw
ROM	Royal Ontario Museum, Toronto, Ontario; Dr. G.B. Wiggins, Mr. B.D. Marshall
SARS	Saskatoon Agriculture Research Station, Agriculture and Agri-Food Canada, Saskatoon, Saskatchewan; Dr. L. Burgess
SDARS	Summerland Agriculture Research Station, Agriculture and Agri-Food Canada, Summerland, British Columbia; Dr. R.D. McMullen; [visited]
SEM	Spencer Entomological Museum, Department of Zoology, University of British Columbia, Vancouver, British Columbia; Dr. G.G.E. Scudder, Mr. S.G. Cannings, Ms. K.M. Needham; [visited]
SJARS	St. John's Agriculture Research Station, Agriculture and Agri-Food Canada, St. John's, Newfoundland; Dr. R.F. Morris



SJRS	Saint-Jean Station de Recherche, Agriculture et Agro-Alimentaire Canada, Saint-Jean-sur-Richelieu, Québec; Dr. R.O. Paradis
SMNH	Saskatchewan Museum of Natural History [now Royal Saskatchewan Museum], Regina, Saskatchewan; Mr. R.R. Hooper
UAE	Strickland Entomological Museum, University of Alberta, Edmonton, Alberta; Mr. D. Shpeley
UCBRK	Essig Museum, Department of Entomology, University of California, Berkeley, California; specimens on loan to, and label data provided by, Dr. C.A. Tauber
UdeM	Université de Montréal, Département des Sciences biologiques, Montréal, Québec; Mme. M. Coulloudon
UG	University of Guelph, Department of Environmental Biology, Guelph, Ontario; Dr. D.H. Pengelly
UL	Université Laval, Département de Biologie, Sainte-Foy, Québec
UMAA	University of Michigan (Ann Arbor), Department of Zoology, Michigan; Mr. G. Breitenbach
UMW	University of Manitoba, Department of Entomology, Winnipeg, Manitoba; Dr. T.D. Galloway; [visited]
UQC	Université de Québec à Chicoutimi, Département des Sciences pures, Chicoutimi, Québec; Dr. A. Francoeur
USNM	United States National Museum (Natural History), Washington, D.C.; Dr. O.S. Flint, Jr. [visited]
USS	University of Saskatchewan (Saskatoon), Department of Biology, Saskatoon, Saskatchewan; Dr. D.M. Lehmkühl
UWO	University of Western Ontario, Department of Zoology, London, Ontario; Dr. W.W. Judd
WLNP	Waterton Lakes National Park, Parks Canada, Alberta; Mr. S. Lunn
WLUM	Wilfred Laurier University (Museum), Waterloo, Ontario; Dr. W.Y. Watson
ZMUH	Zoological Museum, University of Helsinki (Entomology), Helsinki, Finland; Dr. A. Jansson

#### Personal collections

TAUBER, M.J. & C.A., Cornell University, Ithaca, New York; Dr. C.A. Tauber

#### Geographical codens

CANADA: AB, Alberta; BC, British Columbia; MB, Manitoba; NB, New Brunswick; NL, Newfoundland and Labrador; NS, Nova Scotia; NT, Northwest Territories; NU, Nunavut; ON, Ontario; PE, Prince Edward Island; QC, Quebec; SK, Saskatchewan; YK, Yukon.

UNITED STATES OF AMERICA (USA): AK, Alaska.

#### Other symbols

T, total; ♂, male(s); ♀, female(s); ?, gender indeterminate; N, North; S, South; E, East; W, West; p, page(s); FIS, Forest Insect Survey / RIF, Relevé des insectes forestiers; ft, feet; mm, millimeter(s); km, kilometer(s); forward slash (/) designates separate labels.

#### Directory of collectors

This Directory identifies the persons who collected the museum specimens of Chrysopidae in Canada and Alaska. It also identifies the institution(s) where their specimens were deposited at the time of study. Biographical information on some of these persons may be found in Currie (1904), Hewitt (1912), Bethune (1914), Gibson (1939), Carpenter (1945), Ferguson (1954), Bryant (1958), Carpenter (1962), R.D. Bird (1963), Webb (1963), Gilbert (1977), Morris (1980), Lord (1983), MacLellan (1986), Klassen *et al.* (1989), Riepert (1989a, 1989b, 1990, 1991), Riotte (1992), Prévost and Groot (1993), C.D. Bird *et al.* (1995), Place (2002), Holliday (2005). Early issues of *The Canadian Entomologist*, the *Bulletin of the Entomological Society of Canada*, the *Newsletter for Senior Entomologists and Associates*, the *Annual Report of the Forest Insect*

*Survey* [1933–1979], and the publications of the regional entomological societies may contain the names and locations of collectors and collaborators across Canada. Below, the names of collectors are in alphabetical sequence and spelled as they appeared on specimen labels; surnames with the prefix ‘Mc’ are positioned as if the prefix were ‘Mac’.

**A:** E. Adams [SEM]. E.E. Adams [UMW]. J.A. Adams [CNC]. Brian K. Akey [UG]. J.M. Aldrich [USNM]. C.P. Alexander [USNM]. Sandra Allan [UG]. W.R. Allen [NFRC]. R.J. Alton [MCMU]. Marc Amacher [BCPM]. W.B. Anderson [CNC]. F. Andrews [CNC]. D. Antonnuci [ROM]. K.D. Archibald [NSM]. A.P. Arnason [CNC]. P. Arntfield / P.W. Arntfield [CNC, LEM, UG, UMW]. A. Aschim [SMNH]. A.W. Askey [CNC]. D.B. Atkins [UMW]. N.J. Atkinson [CNC]. R.G. Atkinson [SEM]. W.A. Attwater [UG]. C.E. Atwood [ROM]. K.F. Auden [SEM].

**B:** B[anks] [CNC]. A.R.B[rooks] [CNC]. D.B. [SEM]. D.F.B. [CNC]. E.G.B. [UWO]. N.K.B.<sup>5</sup> [ROM]. R.B. [UdeM]. K.L. Bailey [UG]. Thos. Baird [CNC]. A.D. Baker [CNC]. Susan M. Ball [UG]. R.G. Ballmoug [CNC]. Banks [MCZ]. C.M. Barbeau [CNC]. Kevin Barber [UG]. Leon A. Barlow [UG]. D. Barr / D.W. Barr [ROM]. Iain Y.A. Barr [CNC]. C.F. Barrett [CNC, NFRC]. B.A. Batulla [UMW]. D. Beall [UWO]. G. Beall / Geof. Beall [UWO]. K. Beanlands [CNC]. J.I. Beaulne [CNC]. Susan Beierl [UG]. R. Beique [CNC]. B.P. Beirne [CNC]. P. Belanger [UL]. B. Bendell [LEM]. G. Bennett [SEM]. R.G. Bennett [UG]. A. Bergen [UMW]. N.K. Bigelow [ROM]. R.S. Bigelow [CNC]. R.D. Bird [CNC]. F.S. Blanton [USNM]. J.P. Bogart [UG]. E. Bond [CNC]. J. Boone [SEM]. C.L. Botham [CNC]. Susan Bower [UG]. O. G. Boyd [SEM]. C. Boyle [CNC, LEM]. W. Boyle / Wayne Boyle [LEM]. J.C. Bradley [CU]. Mrs. Bramhall [SEM]. E.J. Britten [USS]. Jim Broatch [UMW]. W. Brodie [ROM]. A. Brooks / A.R. Brooks [CNC, USS]. G.S. Brooks [MMM]. J. Brooks / J.E. Brooks [CNC, USS; as A. & J. Brooks, or as A.R. & J.E. Brooks]. A.W.A. Brown [ROM]. N.R. Brown [CNC, MFRC, UWO]. P.C. Brown [CNC]. S.E. Brown [UG]. W.J. Brown [CNC]. Brumpton [CNC; as Kelton & Brumpton]. R.G. Brumpton [UG]. L.H. Bruneau [CNC]. D.G. Bryant [CNC]. O. Bryant / Owen Bryant [CAS, CU]. E.R. Buckell [CNC, KSU, SEM]. Paul Budd [UG]. V.I. Burachynsky [UG]. L. Burgess [SARS]. J. Bushell / J.V. Bushell [CNC]. J.L. Buth [UMW]. K.P. Butler [LEM]. S. Byblow [RARS].

**C:** J.E.C. [LEM]. B.L. Cadogan [UG]. J.D. Calder [CNC]. Calderwood<sup>6</sup> / G.A. Calderwood [CNC]. E.A. Cameron [UG]. F. Cameron [CNC, SEM]. J.K. Cameron [LEM]. J.M. Cameron [LEM]. R. Cameron [CNC]. R.W. Cameron [UG]. A. Campbell [LEM]. D.K. Campbell [BCPM]. W.I. Campbell [CNC, MCMU]. R.A. Cannings [BCPM, SEM]. R.J. Cannings [SEM]. S.G. Cannings [SEM]. F.M. Cannon [CARS]. I.J. Cantrall [UMAA]. F.M. Carpenter [MCZ]. F.S. Carr [CNC]. Carter<sup>7</sup> [CNC]. R.H. Carter [CNC]. W.R. Carter [CNC]. E.F. Cashman [CNC]. A.N. Caudell [USNM]. G. Chagnon [UdeM]. W. Chagnon [LEM]. J.G. Chillcott [CNC]. N.B. Chillcott [CNC]. L. Choquette [UQC]. R.H. Chrystal [CNC]. R.N. Chrystal [CNC]. J. Clark [CNC]. R. Clark / R.C. Clark [CNC, MFRC]. S.M. Clark [CNC]. Walter Clark [CNC]. W. Clemens [ROM]. J.W. Cockle [CNC]. T.V. Cole [UMW]. Noel Comeau / N.M. Comeau [UL]. J. Conn [LCCU]. J.A. Cook [CNC]. F.C. Cooper [ROM]. H.D. Cooper [ROM]. P.T. Copps [UMW]. M. Corboz [UdeM]. C.E. Corfe [ROM]. M. Coulloudon [UdeM]. R. Coyles [CNC]. Miss Cramp [CNC]. R.D. Crawford [UG]. E. Criddle [CNC]. N. Criddle [CNC]. W.J. Crins [APM]. Crotch [MCZ]. L. Crozier [LEM]. E. Cumming [USS]. J.M. Cumming [UG]. C.H. Curran [CNC]. R.P. Currie [USNM]. L.C. Curtis [CNC].

**D:** E.L.D. [LEM]. H.G.D. [CNC]. N.D. [MCZ]. W.H. Danby [CNC]. K. Davey / K.G. Davey [CNC]. L. Daviault [CNC, CRFL, CSQ]. A.G. Davidson [CNC]. D.M. Davies [MCMU]. R.J. Day / Ralph J. Day [NSM]. K.J.G. Deacon [UG]. C. Debora [SEM]. J.J. de Gryse [CNC]. A.A. Dennys [BCPM, CNC]. R.S. Dickhout [UG]. B.A. Dickson [SEM]. A.W. Douglas [LEM]. C. Douglas / C.R. Douglas [IHTN]. A.W. Dow [CNC].

5. N.K. Bigelow, a collector in the 1920's (Riotte 1992: 6).

6. Gordon Calderwood made collections for the Biosystematics Research Institute in the St. Lawrence Islands National Park of Canada during the 1970's. - S.J. Miller, *pers.comm.* 2005.

7. Adrian Carter made collections for the Biosystematics Research Institute [CNC] in the St. Lawrence Islands National Park of Canada during the 1970's. - S.J. Miller, *pers.comm.* 2005.



J.A. Downes [LEM]. W. Downes [CNC, KSU, MCZ, SEM]. A. Downs [CNC]. J.A. Doyle [CSQ]. R. Drent [SEM]. F. Drinkwater [LEM]. D.N. Duffy [LEM]. Jos. Duncan [CSQ]. R. Duncan [SEM]. M.B. Dunn [UAE]. D. Dwyer [CNC]. H.G. Dyar [USNM]. J.R. Dymond [ROM].

**E:** C.J. Edwards [UG]. W.K. Elliott [CNC]. D. Evans [CNC, PFRC, SEM]. Evans / J. Evans<sup>8</sup> [CNC, ROM].

**F:** J.C.F. [UG]. T.F[reeman] [CNC]. W.C.F. [USNM]. R.D. Fairbairn [UG]. G. Fairchild [MCZ]. D.J. Farish [SEM]. W.H. Fell [UMW]. A.N. Ferguson [SEM]. D.C. Ferguson [NSM, USNM]. R.G. Ferguson [ROM]. A.T. Finnamore [LEM]. H.D. Fisher [SEM]. J.C. Fisher [UG]. J.G. Fisher [BCPM]. L. Fisher [RARS]. R.W. Fisher [LEM]. G.H. Fisk [CNC]. H.S. Fleming [CNC]. James Fletcher [CNC]. O.S. Flint [USNM]. Fontana [LEM; as Boyle & Fontana]. G. Fontana [LEM]. W.H. Foott [UMW]. W.T.M. Forbes [CU]. M. Forest [CRFL]. Bernadette Fortin [UdeM]. John F. Fortin [UG]. Ray E. Foster [SEM]. H.R. Foxlee [CNC, SEM]. A. Francoeur [UQC]. G.E. Fraser [USS]. J.L. Frechette [UdeM]. T.N. Freeman [CNC]. E. Fridell [SEM]. E. Fuller [ROM]. H.G. Fulton [CNC]. T.W. Fyles [USNM].

**G:** G. [CNC]. A.M.G. [SEM]. D.G[illespie] [CNC; as E.P. Venables & D.G.]. E.G.G. [UWO]. R.D.G. [LEM]. G. Gagné [UL]. C. Gardener [UG]. L.M. Gardiner [CNC]. J.A. Garland [CNC, LEM, NFRC,UMW]. C.B. Garrett / C.B.D. Garrett [CNC, USNM]. A.N. Gartrell [CNC]. P.S. Geddes / Paul S. Geddes [LEM]. N. Geech [SEM]. Arthur Gibson [CNC]. D.G. Gillespie [CNC]. Robert Glen [CNC]. R. Glendenning [CNC, SEM]. P. Goode [RARS]. J.L. Gordon [SEM]. R.P. Gorham [CNC]. H. Goulet [CNC]. A.R. Graham [CNC]. K. Graham [CNC, MCZ, SEM]. David Gray [UG]. H.E. Gray [CNC, UAE]. D.O. Greenbank [CNC]. M. Greenstone [CU]. G.C.D. Griffiths [UAE]. J.H. Grobler [CNC]. M.O. Guibord [LEM]. M. Gunderman [ROM]. C.S. Guppy [BCPM]. J. Gustafson [LEM].

**H:** R.L.H[orsburgh] [LEM]. R. Haines [MCMU]. J.A. Ham [CNC]. K.A. Hamilton [UMW]. G.H. Hammond [CNC]. R.H. Hannah [MCMU]. B.A. Hannigan [UG]. S. Hansen [SEM]. D.F. Hardwick [CNC]. B. Hardy [SEM]. P.P. Harper [UdeM]. C. Harris [RARS]. J.B. Hartley [CNC]. W. Hartley [ROM]. P. Hebert / P.D. Hebert [ROM]. A.F. Hedlin [UMW]. R.J. Hellewell [UG]. W. Helps / W.G. Helps [CNC, MCMU]. B. Heming / B.S. Heming [CNC, UG]. R. Henniger / R.A. Henniger [CNC]. C.S. Henry [UG]. K.C. Herrmann [CNC]. S.D. Hicks [CNC]. A.E. Hildebrand [CNC]. J.R. Hill [LEM]. S. Hill / Robert S. Hill [UG]. O.S. Hillerud [UAE]. Mrs. Hippisley / Mrs. M.E. Hippisley [CNC, MCZ, USNM]. B. Hocking [UAE]. B. Hodgson [CNC]. J. Hodsman [LEM]. A. Hoeberlin [MCMU]. G.P. Holland [CNC]. R. Hooper [SMNH]. C.E. Hope [ROM]. J.K. Horie [CNC, SEM]. R.L. Horsburgh [LEM]. A. Howden [CNC; as H. & A. Howden]. H. Howden / H.F. Howden [CNC]. R.C. Howell [MCMU]. G.M. Howse [CNC]. H.J. Huckel [CNC]. H.F. Hudson [CNC]. Hughes [CNC; as Mason & Hughes]. A. Hunter [CNC]. L. Huot [UL]. R.L. Hurley [CNC]. L. Hustak [RARS]. F. Huston [CARS]. C.B. Hutchings [CNC].

**I:** F. Ide / F.P. Ide [CNC, ROM]. Idyll [SEM]. Ikram [RARS]. E.A. Innes [UG]. M. Isman [SEM]. W. Ives / W.G.H. Ives [NFRC, UMW].

**J:** R. Jaagumagi [ROM]. J.K. Jacob [CNC, SEM]. G. Jamieson [LEM]. M.S. Jarial [SEM]. L.J. Jobin [CSQ, UL]. F. Johansen [CNC]. E. John [SJARS]. A.F. Johnson [UG]. F. Johnson [CNC]. D. Johnstone / D.E. Johnstone [LEM]. C. Jong [SDARS]. W. Judd / W.W. Judd [CNC, MCMU, UWO]. P. Jursevskis [UG].

**K:** G. Keddie [BCPM]. G. Kelley [RARS]. W. Kelly [CNC]. Kelton [CNC; as Brooks & Kelton]. L.A. Kelton [CNC]. M.K. Kennedy [TAUBER]. G.S. Kenner [SEM; as R.D. Kenner & G.S. Kenner]. R.D. Kenner [SEM]. E.L. Kessel [CAS]. D.K. Kevan [LEM]. Kenneth M. King [CNC]. J.T.B. Kingston [CNC]. Fredk. Knab [USNM]. F.T. Knapp [MCMU]. C. Kofoe [RARS]. Kohalmi [ROM; as Riotte & Kohalmi]. L. Kohalmi [ROM]. V. Kohler [ROM]. L.A. Konotopetz [CNC]. J.P. Kramer [TAUBER]. N.L.H. Krauss [USNM]. R. Krauss [CNC]. E. Krebs [SEM]. H. Krogerus<sup>9</sup> [ZMUH]. I. Kukovica [UG].

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8. J.D. Evans, an early collector in Ontario (Riotte 1992: 6).

9. Dr. H. Krogerus investigated chiefly the Lepidoptera of insular Newfoundland as part of a Finnish-Swedish biological expedition to the Island of Newfoundland in 1949 (Krogerus 1954; Morris 1980).

**L:** G.H.L[arnder] [BCPM]. G. Ladd [LEM]. J.D. Lafontaine [CNC]. J. Lafrance [SJRS]. J.L. Laliberté [CSQ, UL]. C.S. Lallamand [CNC]. R. Lalonde [LEM]. R. Lambert [CNC, CSQ]. J. Lanko [SEM]. J.P. Laplante [CNC, CRFL, UL]. P. Larkin [SEM]. G.H. Larnder [BCPM, SEM]. D. Larson / D.J. Larson / David J. Larson [MU, WLNP]. M.A. Larson [WLNP; as David J. & M.A. Larson<sup>10</sup>]. R.A. Layberry [CNC]. L. LeBlank [CNC]. B.C. LeBlond [CNC]. J.S. Lee [UMW]. H.B. Leech / Hugh Leech / Hugh B. Leech [CAS, CNC, SEM]. R.E. Leech [CNC]. R.H. Leech [CNC]. D. Leprince [LEM]. L. LeSage [CNC, UdeM]. E.G. Lester / Ed. G. Lester [UG]. J.A. Letourneau [CNC]. S. Leung [MCMU]. David Lewis [UG]. G.G. Lewis [CNC]. M. Lichtenberg [UG]. Lindberg<sup>11</sup> [ZMUH]. E.A.R. Liscombe [UMW]. C.C. Loan [CNC]. D. Logan [CNC]. E.B.S. Logier [ROM]. R. Loiselle [UQC]. R. Longmore / R.H. Longmore [CNC, MCZ, SEM]. F. Lord / F.T. Lord [CNC, KARS, UG]. J. Lovrity / J.E. Lovrity [LEM]. V.Z. Lucas [SEM]. Ethel Lyle [UG]. H.H. Lyman [LEM]. D.A. Lymburner [UG]. D.B. Lyons [CNC].

**M:** J.D.M. [SEM]. J.F. McAlpine [CNC]. H.R. MacCarthy [SEM]. F.L. McCarvell [LEM]. M.H. McCleary [UG]. J. McCluskey [CNC]. Donna J. McComb [UG]. D. McCorquodale [APM]. J.W. McCreadie [UG]. A.P. Macdougall [ROM]. E.E. MacDougall [CNC]. J. McDunnough [CNC]. J.E. McFarlane [USS]. McGillis / J.R. McGillis [CNC]. H.G. MacGillivray [CNC]. K.M. McGinnis [UMW]. W.C. McGuffin [UWO]. J.L. McHugh [MCZ, SEM]. M.R. MacKay [CNC]. J. Mackenzie [CNC]. B. McKillop [MMMN]. H. McKinnon [CNC]. J.E. Macklin [UG]. D.F. McLean [CNC, UMW]. J.H. McLeod [SDARS]. J.M. McLeod [CNC]. W.S. McLeod [UMW]. McM. [SEM]. P.W. McMullen [UG]. R.D. McMullen [SDARS]. McNally [UWO]. MacNay [CNC; as Brooks & MacNay]. MacPhee / A.P. MacPhee [CNC]. D.J. Maddar [UMW]. D. Maddison [ROM]. W. Maddison [ROM]. R. Madge / R.B. Madge [CNC]. B.J. Madsen [SDARS]. G. Allen Mail [UAE]. C.H. Mann [CNC]. D.M. Mann [CNC]. E. Mann [CNC]. R. Manuel / R.L. Manuel [LEM]. D.H. Marlow [UMW]. B. Marshall [ROM]. J. Marshall [UG]. Martin [CNC; as Martin & Munroe]. John C. Martin [CNC]. J.E.H. Martin [CNC]. J.L. Martin [LEM]. R.J. Martin [CNC; as J.E.H. & R.J. Martin]. Edith Mason [CNC]. W.R. Mason / W.R.M. Mason [CNC]. W. Mathers [CNC]. Ian D. Matheson [SEM]. R. Matheson [CU]. M. Maw / M.G. Maw [RARS]. G.J. Mayson [CNC]. B.P. Mehra [CNC]. Barb Merchant [UG]. C.D. Miller [CNC]. C.S. Miller [CNC]. S.J. Miller [CNC]. H.E. Milliron [CNC]. L.J. Milne [CNC]. J.C. Mitchell [CNC]. M. Molloy [RARS]. W.J. Moolenbeek [UG]. G.A. Moore [LEM]. Paul Morisset [CSQ]. Claude Morley [BMNH]. Dael Morris [UG]. G.K. Morris [UG]. R.F. Morris / Ray F. Morris [CNC, SJARS]. F.O. Morrison [LEM, UAE]. Peggy Morton [UG]. W.W. Moss [CNC]. Munroe [CNC; as Martin & Munroe]. E. Munroe / E.G. Munroe [CNC, LEM].

**N:** L. Nairn [CNC]. A. Nalewany [SMNH]. G.M. Neal [ROM, SEM]. R. Neill [MCMU]. C.L. Neilson [CNC]. J.J. Neilson [UMW]. F.H. Nelson [CNC]. W.A. Newcombe [BCPM]. T. Norris [MCMU]. W. Norrish [LCCU].

**O:** Odum / A. Odum [ROM; as Smith & Odum, or I. Smith & A. Odum]. E. Oleksuik [ROM]. D. Oliviera [UdeM]. J. Ouellet [UdeM].

**P:** A.M.P. [LEM]. C. Pallen [LCCU]. K.E. Pardy [NDFRC]. Parish / H.S. Parish [CU, MCZ]. R.H. Parry [UG]. C.T. Parsons [MCZ; as F.M. Carpenter & C.T. Parsons]. F. Patenaude [UdeM]. N.A. Patterson [CNC]. L.L. Pechuman [CU]. J. Peck [CNC, as S. & J. Peck]. O. Peck [CNC, UAE]. S. Peck [CNC, as S. & J. Peck]. E. Peden [SEM]. D.J. Peers [MCMU]. D.H. Pengelly [UG]. F.M. Pépin [UdeM]. J.H. Pepper [CNC]. J.M. Perron [UL]. C.E. Petch [CNC]. B.V. Peterson [CNC]. J. Pettit [UG]. A. Phair / A.W.A. Phair [CNC]. R.W. Philip [TAUBER]. J. Phipps [MU]. Nancy Pierce [UG]. R. Pilfrey / R.J. Pilfrey [CNC, UG]. W.R. Plath [ROM]. M.L. Prebble [CNC]. D.J. Pree [UG]. W.B. Preston [MMMN]. Merrill H. Prime [UG]. Provancher [UL]. W.L. Putman [CNC, UG].

10. "WLNP [Waterton Lakes National Park] has a small collection of insects, much of which originates from the efforts of David and Margaret Larson [who] collected during their honeymoon in WLNP" (Langor 2005: 2).

11. Lindberg, Prof. Dr. Håkan, Zool. Museum, The University, Helsingfors, Finland. *Proceedings of the Tenth International Congress of Entomology. Montreal, August 17–25, 1956*. List of Members, 1: 32. [ZMUH: Black Sturge[on] Lake ON, 1–15.viii.1956; Garvel [sic] River ON, 8.viii.1956; and Hudson Heights QC, 24–30.vii.1956 and 24.viii–4.ix.1956]

**Q:** F. Quan [ROM]. Tran Van Quynh [UG].

**R:** K. Racey [SEM]. D. Radcliffe [SEM]. T. Rankin [CNC]. A.G. Raske [CNC]. J.A. Rattenburg [SEM]. Raup [MCZ]. Mona Ray [CNC]. Léo Raynault [CSQ]. D.C. Read [CARS]. D.R. Redmond [CNC]. R. Reich [SEM]. Reid<sup>12</sup> [CNC]. Greg Reid [SJARS]. J. Reid [MCMU]. E.A. Rendell [CNC]. W.R. Richards [CNC]. A. Richardson / A.W. Richardson [CNC]. W.E. Ricker [ROM]. J. Riotte / J.C.E. Riotte [ROM]. G. Rioux [CSQ]. A. Robert [UdeM]. H.A. Robertson [CNC]. A.G. Robinson [CNC, UMW]. J.J. Robinson [SEM]. R. Robitaille [CSQ]. Brian Rolseth [UAE]. D. Ross [UG]. D.H. Ross [CNC]. R.H. Ross [UMW]. W.A. Ross [CNC, USNM]. R. Roughley / R.E. Roughley [UG]. Mona Roy<sup>13</sup> [CNC]. F.V. Royer [CNC]. J. Rousseau [UdeM]. M.H. Ruhmann [BCPM]. K.L. Runciman [UG]. Russell [MCZ]. L.S. Russell [CNC].

**S:** G.E.S[hewell] [CNC]. J.M.S.<sup>14</sup> [CNC]. C. Sabrosky [USNM]. R.I. Sailer [USNM]. R. St-Pierre [RARS]. H. Salkeld [CNC]. G. Salt [CNC, UAE]. R.W. Salt [UAE]. W.A. Salter [UG]. M. Sanborne [MCMU]. F. Sandall [SEM]. M. Sanford [CNC]. Sanson [CNC]. W. Saunders [UG]. T.A. Sawinski [UG]. K.E. Schedl / Karl Schedl / Karl E. Schedl [CNC]. F. Schmid [CNC]. T.H. Scholten [UG]. G.E. Scott [ROM]. G. Scudder / G.G.E. Scudder [SEM]. H.L. Seamans [CNC]. Gayle Sevean [UG]. M. Sharky [*sic*] / M.J. Sharkey [CNC, LEM]. G.V. Shearsmith [CNC]. J. Shepard [SEM]. A.C. Sheppard [CNC, LEM]. G.E. Shewell [CNC]. D. Shpeley [UAE]. G.T. Silver [CNC]. P.J. Skitsko [CNC]. Chas. A. Small [UG]. L. Smillie [MCMU]. C.C. Smith [CNC]. David R. Smith [USNM]. H.J. Smith [LEM]. I. Smith / Ian Smith / I.M. Smith / Ian M. Smith [ROM]. J.M. Smith [UG]. S. Smith [ROM; as I. & S. Smith]. K.D. Southern [UG]. G.J. Spencer [CNC, MCZ, SEM]. R. Stace-Smith [SEM]. S.J. Stark [ROM]. J. Steedman [SEM]. G.L. Steelz [SEM]. W.E. Steenburg [CNC]. Kenneth Stewart [IHTN]. P.J. Stitsko [CNC]. D.B. Stolz [UG]. E.H. Strickland [CNC, UAE]. H. Stultz / H.T. Stultz [CNC, KARS]. K. Sunley [UMW]. G.A. Surgeoner [UG]. D. Sutherland [SEM]. Swales [MU; as Larson & Swales].

**T:** W.H. Tams [CNC]. P.M. Taschereau [NSM]. C.A. Tauber [CU]. M. Tauber [CU]. M.J. & C.A. Tauber [TAUBER]. P.J. Tauber [TAUBER]. P.A. Taverner [CNC]. G.W. Taylor [CNC]. K. Taylor [SEM]. M.E. Taylor [USS]. Tom C. Taylor [UG]. Laura Templin [UG]. H.J. Teskey [CNC]. J. Thibault [UdeM]. G. Thomas / G.A. Thomas [RARS]. J.B. Thomas [CNC, LEM]. L.S. Thompson [CARS]. M.G. Thomson [SEM]. Thorpe [CNC; as Kelton & Thorpe]. L.L. Tibbles [UG]. D. Timmons / Donna Timmons [SJARS]. W. Tomkinson [SEM]. W. Tostowaryk [UMW]. W. Touzeau [SEM]. R.C. Treherne [CNC]. K.C.S. Tuckey [UG]. Lola Turcotte [UG]. R.A. Turner [CNC]. D.C. Turnock [MMMN].

**U:** F.A.U. [ROM]. G.J. Umphrey [UG]. G.R. Underwood [CNC]. A. Unrau [SEM].

**V:** V.R.V[ickery] [LEM]. E.C. Van Dyke [CAS]. J.D. Van Loon [UG]. J.A. Van Reenen [SEM]. A.L. Van Slyke [CNC<sup>15</sup>]. R. Vanstone [RARS]. E.P. Venables [CNC]. S.D. Vickery [LEM]. V.R. Vickery [LEM]. H.L. Viereck [CNC]. J.R. Vockeroth [CNC]. G. Volk [RARS]. P.N. Vroom [CNC].

**W:** E.M.W[alker] [ROM]. M.Y.W. [SEM]. N.V.W. [SEM]. R.W. [USS]. Walker / E.M. Walker [MCZ, ROM]. G. Walker [PIDAA]. G.S. Walley [CNC]. Wallis [CNC; as Brooks & Wallis]. J.B. Wallis [CNC, MCZ]. H.C.W. Walther [CNC]. D. Ward [RARS]. I.J. Ward [CNC]. A.E. Warren [MCMU]. R.H. Washburn / Richard H. Washburn [USNM]. J. Waterfield [MCZ]. J.S. Waterhouse [CNC]. D.L. Watson [CNC]. E.B. Watson [CNC]. W.Y. Watson [GLFRC]. F.W. Waugh [CNC]. F.E. Webb [CNC]. Wellington [SEM]. M.F. Welsh [SEM]. P.H. Westdal [CNC]. R.V. Whelan [ROM]. D.P. Whillans [CNC]. L.T. White [NFRC]. Whitney [CNC; as Kelton & Whitney]. G.B. Wiggins [ROM]. R. Hazen Wigmore [CNC]. Nancy Wilcox [UG]. S.J. Wilcox [ROM]. W. Wilde / W.H. Wilde [CNC, SDARS, SEM]. G.H. Wilson [UG]. W.G. Wilson [CNC]. N. Winchester / N.N. Winchester [UCBRK]. A.F. Winn [LEM]. R. Wise [RARS]. Bert Wit [UG]. E. Wolfe

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12. Wes Reid made collections for the Biosystematics Research Institute in the St. Lawrence Islands National Park of Canada during the 1970's. - S.J. Miller, *pers.comm.* 2005.

13. Garland 1982 [1984]:345, line 13: Mona Ray, should read Mona Roy; labels are correct [CNC].

14. J.M. Swaine, first appointed Entomologist responsible for Forest Insects (Hewitt 1912: 11).

15. Tauber (1969) reported specimens from the University of New Brunswick (Forestry); the ones collected by A.L. Van Slyke now are deposited at Agriculture Canada in Ottawa [CNC].

[MCMU]. A.A. Wood [CNC]. D. Wood [SEM]. D.M. Wood [CNC]. B. Wright / Barry Wright [CNC, NSM, UG]. B.K.W. Wyatt [UG]. S. Wyatt [CNC].

**X Y Z:** H.W.H. Zavitz [UG].

## Results

The systematic arrangement followed here is alphabetical. The generic classification follows that of Brooks and Barnard (1990), modified for family-group names by Brooks (1997) and Nel *et al.* (2005); and further modified for *Chrysopodes* by Tauber (2003). Higher classification, i.e., above family level, follows Kluge (2005). Nomenclature is in full agreement with the *International Code of Zoological Nomenclature*.<sup>16</sup> References cited relate to the Chrysopidae in Canada and Alaska; they are not intended to be comprehensive. Synonymy pertaining to Canada and Alaska is based on specimens examined. Data for new records are as they appear on the labels; forward slashes (/) designate separate labels.

### SUPERFAMILY *CHRYSOPOIDEA* Nel *et al.*, 2005

*Chrysopoidea* Nel *et al.*, 2005: 31.

The superfamily comprises six families, i.e., five families known only from Mesozoic fossils (Allopteridae, Liassochrysidae, Limaiidae, Mesochrysopidae, Tachinymphidae), and the Chrysopidae, which includes Late Jurassic and Early Cretaceous fossils, and all Recent species (Adams 1967; Séméria and Nel 1990; Nel *et al.* 2005).

### FAMILY *CHRYSOPIDAE* Schneider, 1851

*Chrysopina* Schneider, 1851: 35. Type genus: *Chrysopa* Leach, 1815; original designation.

*Chrysopidae* Schneider, 1851; Newman 1853: cc [ending in -idae].

The family Chrysopidae includes fossils, and all Recent species (Nel *et al.* 2005). A global genus-level revision of the family was fulfilled by Brooks and Barnard (1990), who arranged 75 genera, 11 subgenera, and approximately 1200 described species or subspecies into three subfamilies, as follows: Apochrysinæ, Chrysopinæ, Nothochrysinæ (Brooks and Barnard 1990; Brooks 1997). Two of these subfamilies are represented in Canada: i.e., Chrysopinæ, and Nothochrysinæ; in Alaska, only the Chrysopinæ.

### SUBFAMILY *CHRYSOPINAE* Schneider, 1851

*Chrysopina* Schneider, 1851: 35. Type genus: *Chrysopa* Leach, 1815; original designation.

*Chrysopinæ* Schneider, 1851; Esben-Petersen 1918: 27 [ending in -inae].

This subfamily has four tribes: Ankylopterygini, Belonopterygini, Chrysopini, Leucochrysinini (Brooks and Barnard 1990; Brooks 1997; New 2001). The Chrysopini are represented in Canada, and Alaska.

### TRIBE *CHRYSOPINI* Schneider, 1851

*Chrysopina* Schneider, 1851: 35. Type genus: *Chrysopa* Leach, 1815; original designation.

Crisopinos Navás, 1910: 59.

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16. Available from: <http://www.iczn.org/iczn/index.jsp> (October, 2006)



*Chrysopiscini* Navás, 1910: 59. Type genus: *Chrysopisca* MacLachlan, 1875 [to *Chrysopa*: Brooks and Barnard 1990].  
*Suarini* Navás, 1914: 73. Type genus: *Suaris* Navás, 1914.  
*Chrysopini* Navás, 1914: 76.

This tribe, treated here as monophyletic (Winterton and de Freitas 2006), occurs worldwide (Brooks and Barnard 1990; Brooks 1997). This is the largest tribe of Chrysopidae, with more than 30 genera (Brooks 1994). The New World chrysopine fauna contains 12 genera (Monserat *et al.* 2001). In Canada, nine genera or subgenera occur, as follows: *Ceraeochrysa*, *Chrysopa*, *Chrysoperla*, *Chrysopodes* (*Neosuarius*), *Dichochrysa*, *Eremochrysa* (*Chrysopiella*), *Eremochrysa* (*Eremochrysa*), *Meleoma*, and *Nineta*; in Alaska, only two genera: *Chrysopa*, and *Chrysoperla*.

## GENUS *CERAEOCHRYSA* Adams, 1982

*Ceraeochrysa* Adams, 1982: 70. Type species: *Chrysopa cincta* Schneider, 1851; original designation.

*Ceraeochrysa* is a New World genus (Adams 1982), containing 40 described species and several undescribed species distributed throughout North and South America and the West Indies, but predominantly in South America (Brooks and Barnard 1990). The adults feed on honeydew or nectar; the larvae are debris-carriers (Adams 1982). One species occurs in Canada, as follows:

### *CERAEOCHRYSA LINEATICORNIS* (Fitch, 1855)

*Chrysopa lineaticornis* Fitch, 1855: 795; see also, 1856: 91–92. Type: USA: New York [State]; original designation; male, MCZ (Adams 1982).

*Ceraeochrysa lineaticornis* (Fitch, 1855): Adams 1982: 73.

### SYNONYMY PERTAINING TO CANADA

*Ceraeochrysa lineaticornis*: Garland 1984: 93; 1985a: 737–751; Penny *et al.* 1997: 48 (part).

*Chrysopa* sp.: Downes 1974: 121–122 (part: first of two larvae).

*Chrysopa lineaticornis*: Putman 1932b: 121–126; Smith 1932: 584 (part: footnote 4), 585; Bickley and MacLeod 1956: 190–191; Bram and Bickley 1963: 10; Throne 1971: 74–75.

*Glenochrysa lineaticornis*: Garland 1982 [1984]: 245–249, 407–408, Figs. 74, 108–112, Map 20.

**CANADA: T = 38** (12♂, 21♀, 5?) + 1 larva. **FIRST RECORD:** NS: 2♀, Bridgetown, 31.vii.[19]12 (G.E.S[hewell]) [CNC]. **FLIGHT PERIOD:** May 20 (1951; Lac-Mondor, Sainte-Flore QC)–September 7 (1950; Mount Uniacke NS).

**NB: T = 3** (2♀, 1?). **FIRST RECORD:** 1♀, Tabusintac, 20.vii.1939 (J. McDunnough) [CNC]. **FLIGHT PERIOD:** June 29 (1947; Fredericton)–July 24 (1947; Chipman). **LOCALITIES:** Chipman [46°10'09"N 65°53'06"W; CNC]. Fredericton [45°56'43"N 66°40'00"W; CNC]. Tabusintac [47°20'N 65°01'W; CNC].

**NS: T = 4** (1♂, 3♀). **FIRST RECORD:** 2♀, Bridgetown, 31.vii.[19]12 (G.E.S[hewell]) [CNC]. **FLIGHT PERIOD:** June 29 (1934; South Milford)–September 7 (1950; Mount Uniacke). **LOCALITIES:** Bridgetown [44°51'N 65°18'W; CNC]. Mount Uniacke [44°54'N 63°50'W; USNM]. S[outh] Milford [44°34'N 65°24'W; CNC].

**ON: T = 19** (6♂, 11♀, 2?) + 1 larva. **FIRST RECORD:** 1♀, Fisher Glen, 11.vi.[19]31 (G.S. Walley) [CNC]. **NEW RECORDS:** 1♀, P.F.E.S.<sup>17</sup>, 3/8/48 [3.viii.1948] (J.A. Ham<sup>18</sup>) / [type-written] (3–27) / [type-written] (U.N.B.27) / [paper rectangle with a green and yellow band at one end] / [paper disc, yellow] / [type-written] (2115) / (*Chrysopa lineaticornis* Fitch, Det. P. Adams) [CNC]. **FLIGHT PERIOD:** June 11 (1931; Fisher Glen)–September 2 (1931; St. Davids). **LOCALITIES:** Bala [45°01'N 79°37'W; CNC]. Black Lake, N[orth] Burgess

17. Petawawa Forest Experiment Station, 1918–1979; subsequently the Petawawa National Forestry Institute, 1979–1996, and the Petawawa Research Forest, 1996–present (Place 2002).

18. J.A. Ham, a student at the University of New Brunswick (Forestry), originated from Ottawa and graduated from U.N.B. in 1949 (Bryant 1958: 113).

T[ownshi]p [Black Lake, Lanark County, 44°46'N 76°18'W; LEM<sup>19</sup>]. Cawaja Beach, Tiny T[ownshi]p, Simcoe Co[unty] [44°42'N 80°01'W; ROM]. Chaffeys Locks [44°35'N 76°19'W; ROM]. Constance Bay [45°30'N 76°05'W; CNC]. Fisher Glen [45°21'02"N 75°42'40"W; CNC]. Go Home Bay [44°59'N 79°56'W; CNC]. Marmora [44°29'N 77°41'W; CNC]. One Sided Lake [Claxton Township, Rainy River District<sup>20</sup>, 49°03'N 93°54'W; CNC]. Parry Sound [45°21'N 80°02'W; CNC]. P[etawawa] F[orest] E[xperiment] S[tation] [Chalk River<sup>21</sup>, 46°01'N 77°27'W; CNC]. S[ain]t Davids [43°10'N 79°07'W; UG]. S[outh] Neebing T[ownshi]p<sup>22</sup> [Neebing, 48°10'N 89°25'W; ROM]. Wagerville [Wagarville, 44°38'N 76°48'W; CU]. Zealand T[o]w[nshi]p Div[ision] 21 [Kenora District, Zealand, 49°51'N 92°46'W; CNC].

**QC: T = 11** (5♂, 5♀, 1?). **FIRST RECORD:** 1?, Meach Lake, 21.vi.1916 [collector unknown; CU<sup>23</sup>]. **FLIGHT PERIOD:** May 20 (1951; Lac-Mondor, Sainte-Flore)–August 23 (192\_; Shawbridge). **LOCALITIES:** Aylmer [45°23'42"N 75°49'56"W; CNC]. Berthier [46°05'18"N 73°12'44"W; UdeM]. Ile-Perrot [L'Île-Perrot, 45°23'N 73°57'W; LEM]. Lac Mondor, S[ain]te Flore [Lac-Mondor, Sainte-Flore, 46°37'32"N 72°45'52"W; CNC]. Meach Lake [Lac-Meech, 45°31'35"N 75°52'25"W; CU]. Rigaud [45°29'N 74°18'W; UdeM]. S[ain]te Anne de Bellevue, [Morgan] Arboretum [Sainte-Anne-de-Bellevue, 45°24'11"N 73°56'58"W; LEM]. Shawbridge [45°52'17"N 74°04'45"W; LEM].

**SK: T = 1** (?). **FIRST RECORD:** 1? [abdomen missing], Hazelcliffe, 14.viii.1925 (Kenneth M. King) / (*Chrysopa lineaticornis* Fitch, Det. R.C. Smith) [CNC]. **FLIGHT PERIOD:** August 14 (1925; Hazelcliffe). **LOCALITIES:** Hazelcliffe [50°34'N 101°58'W; CNC].

*Ceraeochrysa lineaticornis* occurs in Canada, from Nova Scotia to Saskatchewan. No specimen has yet been seen from Manitoba or Prince Edward Island, but this species could be anticipated there, as noted by Garland (1985a). Canadian localities in literature for which no specimen has been seen, are: Niagara ON (Smith 1932). All specimens reported here are documented with data in Garland (1982 [1984]), or as new records (above). Based on label data, adults have been taken at light, and associated with Alder and Balsam Fir. Larvae have the typical trash-carrying body form (Monserrat *et al.* 2001); for distinguishing traits, see Tauber *et al.* (2000).

## GENUS *CHRYSOPA* Leach, 1815

*Chrysopa* Leach, 1815: 138. Type species: *Hemerobius perla* Linnaeus, 1758, *sensu* Schneider, 1851, *In*: Tjeder 1952: 202–205; subsequent designation, i.e., previous selections rejected and *perla* L. designated type and placed on Official List of Specific Names in Zoology as Name No. 22 (Hemming 1954); monotypy (Tjeder 1966).

*Chrysopa* is represented by more than 50 described species, some with defined subspecies, in Asia, Europe, and North America (Brooks and Barnard 1990). In the New World, the genus is restricted to North America (Monserrat *et al.* 2001). Larvae are naked (Monserrat *et al.* 2001). Adults are predaceous, and the larvae overwinter as diapausing third instars within cocoons (Toschi 1965; Brooks and Barnard 1990; Penny *et al.* 2000). In North America, 10 species are recognised (Penny *et al.* 2000): seven of these occur in Canada; two occur in Alaska. *Chrysopa quadripunctata* and *C. slossonae* adults have been reported to interbreed in captivity (Albuquerque *et al.* 1997), and it is difficult to distinguish between them using preserved adults based solely upon the taxonomic characters outlined by Banks (1924; *cf.* Penny *et al.* 2000), which are highly subjective. It is possible, therefore, that *C. slossonae* specimens are included among those listed for *C. quadripunctata* from Canada.

19. Record based on a single larva, No. 837-1-2; determination by C.A. Tauber *in litt* 1981. Downes (1974) found this larva in July 1971, at Black Lake near Stanleyville ON.

20. J.E.H. Martin, personal communication [1980].

21. Petawawa Forest Experiment Station (now Petawawa Research Forest), located in the northern 100 km<sup>2</sup> of the Petawawa Military Reserve near Chalk River ON; Headquarters on the shore of Corry Lake, about 3–4 miles from Chalk River (Place 2002: 5).

22. (South) Neebing Township, near Thunder Bay (Riotte 1992: 7).

23. Label data without gender provided by L.L. Pechuman *in litt.* 1980.



## **CHRYSOPA CHI Fitch, 1855**

*Chrysopa chi* Fitch, 1855: 791; 1856: 87. Type: USA: New York [State]; monotypy; female, MCZ (Penny *et al.* 1997).

### **SYNONYMY PERTAINING TO CANADA**

*Chrysopa chi*: Provancher 1869: 140; 1871a: 142; 1871b: 269; 1877a: 120; 1877b: 203–205; Brodie and White 1883; Gibson 1914: 127; 1915: 149; Bickley and MacLeod 1956: 192; Tjeder 1960: 148; Bram and Bickley 1963: 8; Throne 1971: 70; Garland 1982 [1984]: 186–195, 361–373, 413, Figs. 69–74, Map 15; 1984: 93; 1985a: 737–751, 759; Penny *et al.* 1997: 49; Garland 2000: 39.

*Chrysopa chi* var. *chi*: Smith 1932: 592; Spencer 1942: 27.

*Chrysopa chi* var. *upsilon*: Smith 1932: 592; Spencer 1942: 27.

*Chrysopa intima chi*: Garland 1989: 181.

*Chrysopa upsilon*: Provancher 1871a: 142; 1871b: 269; 1877a: 120; 1877b: 203, 205; Brodie and White 1883.

*Chrysopa ypsilon*: Banks 1903: 148; Gibson 1912: 110; 1913: 137; 1914: 128; A.W.A. Brown 1934: 211.

### **SYNONYMY PERTAINING TO USA-ALASKA**

*Chrysopa chi*: Garland 1982 [1984]: 360.

**CANADA: T = 608** (260♂, 297♀, 51?). **FIRST RECORD**: BC: 1♂, Vanc[ouver] Island, 2.vi.[18]88 (G.W. Taylor) / (*Chrysopa chrysops* L., Det. P. Adams) [CNC]. **FLIGHT PERIOD**: May 14 (1926; Agassiz BC)–September 25 (1923; Edmonton AB).

**AB: T = 46** (18♂, 23♀, 5?). **FIRST RECORD**: 1♂, Lethbridge, 25.v.1921 (E.H. Strickland) / (*Chrysopa chrysops* L., Det. P. Adams) [CNC]. **NEW RECORDS**: 1♂, 1♀, Devon, 16.vi.[19]80 [collector unknown] [NFR]. 1♂, 1♀, Kananaskis For[est] Exp[eriment] Sta[tion], Seebe, 3.vii.1968 (H.J. Teskey) / (Malaise trap) [CNC]. **FLIGHT PERIOD**: May 24 (1923; Calgary)–September 25 (1923; Edmonton). **LOCALITIES**: Banff [51°10'N 115°34'W; CU]. Beaverlodge [55°13'N 119°26'W; UAE]. Bellevue [conflicting place names; BCPM]. Calgary [51°03'N 114°05'W] [UAE]. C[lares]holm [50°02'N 113°35'W; UAE]. Cooking Lake [53°25'N 113°08'W; UAE]. Delburne [52°12'N 113°14'W; UG]. Demmitt [57°27'N 119°54'W; CNC]. Devon [53°22'N 113°44'W; NFR]. Edmonton [53°33'N 113°28'W; CNC, UAE]. Fawcett [54°32'N 114°05'W; UAE]. Grande Prairie [55°10'N 118°48'W; CNC]. Gull Lake [52°28'N 113°57'W; UAE]. High Prairie [55°26'N 116°29'W; CNC]. Hines Creek [56°15'N 118°36'W; CNC]. Kananaskis F[orest] E[xperiment] S[tation]<sup>24</sup> / Kananaskis For[est] Exp[eriment] Sta[tion], Seebe [Barrier Lake, 51°01'N 115°04'W; CNC]. Lac La Biche [54°46'N 111°58'W; CNC]. Lethbridge [49°42'N 112°49'W; CNC]. Rycroft [55°45'N 118°43'W; CNC]. Seebe / D.F.S. Seebe [51°06'N 115°04'W; CNC]. Wabamun [53°33'N 114°28'W; UAE]. Waterton Lakes Nat[ional] P[ar]k / Waterton Lakes Nat[ional] P[ar]k, at Park Gate, 4200 ft [1280 m] [49°05'N 113°52'W; CNC, WLNP]. Wetaskiwin [52°58'N 113°22'W; UAE].

**BC: T = 74** (29♂, 37♀, 8?). **FIRST RECORD**: 1♂, Vanc[ouver] Island, 2.vi.[18]88 (G.W. Taylor) / (*Chrysopa chrysops* L., Det. P. Adams) [CNC]. **NEW RECORDS**: 1♂, Salmo Pass, 5.vii.1965 (F. Schmid) [CNC]. 1♂, Vancouver Is[land], Thetis Lake P[ar]k, 30.vi.[19]84 (M. Sharky [*sic*]<sup>25</sup>) [CNC]. **FLIGHT PERIOD**: May 14 (1926; Agassiz)–July 29 (1948; Soda Creek). **LOCALITIES**: Agassiz [49°14'N 121°46'W; CNC]. Barriere [Barrière, 51°11'N 120°07'W; CNC]. Bear Lake<sup>26</sup> [40°03'N 117°12'W; USNM]. Burnaby [46°16'N 122°57'W; SEM]. Carbonate [Carbonate Creek], Columbia River, 2600 ft [792 m] [CU]. Clinton [51°05'N 121°35'W; CNC]. Coquitlam [49°17'N 122°45'W; SEM]. Downie Creek [conflicting place names], 10 mi[les] N [SEM]. Gavin L[ake] [52°29'N 121°44'W; SEM]. Haney, Univ[ersity of] B[ritish] C[olumbia] Forest [Garibaldi Park, 50°00'N 122°45'W; ROM]. Hazelton [55°15'N 127°40'W; CNC<sup>27</sup>]. Kamloops [50°40'N

24. Kananaskis Forest Experiment Station: established in 1936 by the federal government, converted to an internment camp during World War II, reverted in 1948 to use as Forest Experiment Station; since 1966 operated by the University of Calgary as Barrier Lake Field Station, Summer Institute in Ecology Education; located 45 km E of Canmore, 80 km W of Calgary; see also Johnson 2000. Available from: <http://www.ucalgary.ca/UofC/research/KFS/> (October, 2006)

25. M.J. Sharkey: the label must have been written by someone other than the collector.

26. Bear Lake, placed near Prince George by Garland (1982 [1984]: 139), is here corrected to the Kootenay Region based on information provided by Currie (1904), Dyar (1904: 781), and Flint (2002: 90).

120°19'W; SEM]. Kaslo [49°55'N 116°55'W; USNM]. Kleanza Creek, 14 mi[les] E of Terrace, 250 ft [76 m] [54°36'N 128°25'W; CNC]. Lakelse Lake bog, Terrace [Lakelse Lake Provincial Park, 54°23'N 128°31'W; CNC]. Liard Hot Springs, Alaska H[igh]w[a]y, mi[le] 496, 1500 ft [457 m] [59°25'40"N 126°06'15"W; CNC]. MacGillivray Creek Game Reserve, n[ear] Chilliwack [McGillivray Slough, 49°07'35"N 122°05'35"W; CNC]. Milner [49°08'N 122°37'W; MCZ]. Mission City [Mission, 49°08'N 122°18'W; CNC]. New Westminster [49°13'N 122°55'W; UWO]. Nicola [50°10'N 120°40'W; CNC]. Pouce Coupe [55°43'N 120°08'W; CNC]. Quesnel [53°00'N 122°30'W; SEM]. Rolla [55°54'N 120°08'W; CNC]. Salmo Pass [Allison Pass, 49°07'N 120°52'W CNC]. Sicamous [50°50'N 118°59'W; CNC]. Slocan Park, 117°39'N 49°32'W [SEM]. Soda Creek [52°21'N 122°17'W; SEM]. Terrace / Terrace, 220 ft [67 m] / Terrace, 6 mi[les] W, Gagnon R[oad], 220 ft / Terrace, 10 mi[les] W, 220 ft [54°31'N 128°36'W; CNC]. Trinity Valley [50°24'N 118°55'W; SEM]. Vancouver / Vancouver, Univ[ersity of] B[ritish] C[olumbia] [49°15'N 123°07'W; MCZ, SEM]. Vanc[ouver] Island [CNC]. Vancouver Is[land], Thetis Lake P[ark] [Thetis Lake, 48°28'N 123°28'W; CNC]. Vernon [50°15'30"N 119°16'00"W; CNC, SEM]. W[est] Crescent Valley, 49°24'N 117°39'W, 3000 ft [914 m] [Crescent Valley; SEM].

**MB: T = 58** (25♂, 25♀, 8?). **FIRST RECORD:** 1♂, 1♀, Winnipeg, 10.vi.[19]10 (J.B. Wallis) / (b16) / (*C. ypsilon*, *Teste* Banks) / (*Chrysopa chrysops* L., Det. P. Adams) [CNC, MCZ]. **NEW RECORDS:** 1? [abdomen missing], Rennie, Tam[arack] bog, 14.vi.[19]57 (W. Ives) [NFRC]. 1? [abdomen missing], Rennie, 6-8-[19]61 [collector unknown] / (Fl[u]or[escent] Lamp, 6-8-61) [NFRC]. **FLIGHT PERIOD:** May 21 (1980; Glenlea Research Station)–August 6 (1961; Rennie). **LOCALITIES:** Aweme [49°42'31"N 99°36'10"W; CNC]. Carberry [49°52'08"N 99°21'34"W; CNC]. Cedar Lake [53°19'45"N 100°10'08"W; MCZ]. Dauphin [51°08'58"N 100°02'58"W; MCZ, ROM]. D[uck] M[ountain] F[orest] R[eserve] [Duck Mountain Provincial Forest, 41°29'59"N 101°10'00"W; CNC]. Falcon Lake Campground, Whiteshell Prov[incial] P[ark] [Falcon Lake, 49°41'11"N 95°19'34"W; ROM]. Forrest, 2 mi[les] N [49°57'59"N 99°56'12"W; CNC]. Glenlea Res[earch] St[atio]n<sup>28</sup> [Glenlea, 49°38'08"N 97°08'06"W; LEM]. Lockport [50°04'59"N 96°56'40"W; UMW]. Ninette [49°24'00"N 99°37'48"W; CNC]. Red Rock L[ake]<sup>29</sup> [49°59'08"N 95°31'19"W; CNC]. Rennie / Rennie, Tam[arack] bog / Rennie, Life Table Plot [49°51'10"N 95°33'10"W; CNC, NFRC]. R[iding] M[ountain] N[ational] P[ark] [50°53'N 100°15'W; CNC]. Shilo, 5 mi[les] SW [49°48'20"N 99°38'28"W; CNC]. Treesbank [49°38'10"N 99°36'34"W; MCZ]. University of Manitoba [Fort Garry, 49°50'29"N 97°09'00"W; LEM]. Winnipeg [49°53'04"N 97°08'47"W; CNC, MCZ].

**NB: T = 15** (7♂, 7♀, 1?). **FIRST RECORD:** 1♀, Killarney Lake, Fredericton, 21.vii.1922 (B[anks]) / (*Chrysopa chi* var. *ypsilon*, Det. R.C.S[mith]) / (*Chrysopa chrysops* L., Det. P. Adams) [CNC]. **NEW RECORDS:** 1♀, Kouchibouguac N[ational] P[ark], Code 5281C, 14.vi.1977 (J.D. Lafontaine) [CNC]. 2♂, Kouchibouguac N[ational] P[ark], Code 5315K, 17.vi.1977 (J.R. Vockeroth) [CNC]. 2♂, Kouchibouguac N[ational] P[ark], Code 5368L, 23.vi.1977 (S.J. Miller) [CNC]. 1♀, Kouchibouguac N[ational] P[ark], Code 5599I, 13.vii.1977 (G.A. Calderwood) [CNC]. **FLIGHT PERIOD:** June 14 (1977; Kouchibouguac National Park)–July 21 (1922; Killarney Lake, Fredericton). **LOCALITIES:** Fredericton [45°56'43"N 66°40'00"W; CNC]. Killarney Lake, Fredericton [46°01'N 66°38'W; CNC]. Kouchibouguac<sup>30</sup> N[ational] P[ark], Codes 5281C / 5315K / 5368L / 5599I / 7092T / 7092Y [Kouchibouguac National Park of Canada, 46°51'30"N 64°58'30"W; CNC]. S[ain]t John [45°15'33"N 66°02'20"W; UG].

**NL: T = 50** (24♂, 24♀, 2?). **FIRST RECORD:** 1♂, Gander, 19.vii.1949 (R.A. Henniger) / (*Chrysopa chrysops* L., Det. P. Adams) [CNC]. **FLIGHT PERIOD:** June 1 (1973; St. George's)–August 3 (1967; St. John's, Agric. Exp. Sta.). **LOCALITIES:** Bell Island [47°37'40"N 52°57'50"W; SJARS]. Bishops Falls / Bishops Falls, Exploits R[iver] [Bishop's Falls, 49°01'N 55°29'W; SJARS, USNM]. Bloomfield, Bonavista Bay, NW Arm

27. Record in Garland 1982 [1984]: 361: Hazelton: 1♀, 26.vii.1960 (C.M. Barbeau) [CNC], should read: 1♀, 26.vii.1920 (C.M. Barbeau) [CNC]; the year of collection is hereby corrected.

28. The University of Manitoba's Glenlea Research Station is located just south of Winnipeg.

29. The Winnipeg Forest Entomology Laboratory's Whiteshell Field Station on Red Rock Lake MB was commenced in 1948 (Webb 1964: 18).

30. Garland 1982 [1984]: 371, line 9: Kouchibougouac, should read: Kouchibouguac; label is correct.

[48°23'N 53°54'W; USNM]. Deer Lake / Deer Lake, 5 mi[les] SW [49°10'N 57°26'W; MU, USNM]. Eastport [48°39'N 53°45'W; USNM]. Exploits River, Pond Bridge [Exploits River, 49°04'58"N 55°19'30"W; USNM]. Gander [48°58'06"N 54°35'33"W; CNC, USNM]. Glenwood, 12 mi[les] S [48°59'N 54°53'W; MU]. Holyrood, Conception Bay [47°23'N 53°08'W; USNM]. Millville, Codroy River [47°51'N 59°21'W; USNM]. M[oun]t Pearl [47°31'N 52°47'W; SJARS]. Norris Point [49°31'N 57°53'W; SJARS]. Oxen Pond, S[ain]t John's [47°34'15"N 52°45'55"W; MU, SJARS]. Pasadina [49°01'N 57°36'W; MU]. Portugal Cove, Indian Meal Line [47°38'N 52°51'W; MU]. Rocky Harbour [49°36'N 57°55'W; SJARS]. Rushy Pond, nr. Grand Falls [48°57'N 55°48'W; MU]. S[ain]t Georges / S[ain]t Georges, 3 mi[les] SE [Saint George's, 48°26'N 58°29'W; SJARS, USNM]. S[ain]t John's / S[ain]t John's, Agric[ultural] Exp[eriment] Sta[tion] [47°34'N 52°44'W; CNC, MU, SJARS]. Shoal H[arbou]r [48°11'N 53°59'W; SJARS]. Terra Nova Nat[ional] P[ar]k [48°31'50"N 53°55'44"W; USNM]. Tompkins [47°48'N 59°13'W; SJARS].

**NS: T = 28** (13♂, 12♀, 3?). **FIRST RECORD:** 1 ?, Truro, 7.vii.1913 (R. Matheson) [CU<sup>31</sup>]. **NEW RECORDS:** 1♂, C[ape] B[reton] Highlands N[a]t[ional] P[ar]k, Fishing Cove Trail, 25.vi.1984 (H.J. Teskey) [CNC]. 1♀, C[ape] B[reton] H[ighlands] N[at]ional P[ar]k, 1 km SW of Mary Ann Falls, 2.vii.1983 (R.A. Layberry) [CNC]. 1♂, S[outh] Harbour, PG929935, 27.vi.1983 (J.R. Vockeroth) / (marshy lake shore, brackish water; Carex, Iris, Juncus) [CNC]. 1♂, S[outh] Harbour B[ea]ch, PG962943, 27.vi.1983 (J.R. Vockeroth) / (mixed dry mesophytic woods, J.R. Vockeroth) [CNC]. **FLIGHT PERIOD:** June 7 (1959; Canard)–August 6 (1970; Inverness). **LOCALITIES:** Antigonish Co[unty], Fairmont R[oa]d / Fairmont R[oa]d, 5 mi[les] E [Fairmont, 45°42'N 61°59'W; NSM, USNM]. Armdale [44°38'N 63°38'W; NSM, USNM]. Aylesford [45°02'N 64°50'W; USNM]. Beech Hill, Antigo[nish] Co[unty] [45°35'N 61°58'W; NSM]. Blomidon [45°13'N 64°22'W; CNC]. Canard [45°08'N 64°26'W; CNC]. C[ape] B[reton] H[ighlands] N[a]t[ional] P[ar]k, Fishing Cove Trail [Fishing Cove, Inverness County, 46°48'N 60°53'W; CNC]. C[ape] B[reton] H[ighlands] N[at]ional P[ar]k, 1 km SW of Mary Ann Falls [Mary Ann Falls, Victoria County, 46°46'N 60°22'W; CNC]. Chester [44°33'N 64°15'W; NSM]. Durham [45°37'N 62°49'W; LEM]. Inverness [46°20'N 61°05'W; USNM]. Kentville [45°05'N 64°30'W; CNC]. Meal Cove [Meal Cove, 47°02'N 60°34'W; UdeM]. Pictou [45°41'N 62°43'W; ROM]. Portapique [45°24'N 63°42'W; LEM]. S[ain]t Paul Island, Cabot Strait [47°12'N 60°09'W; USNM]. S[outh] Harbour, PG929935 [46°52'N 60°28'W; CNC]. S[outh] Harbour B[ea]ch, PG962943 [46°53'N 60°26'W; CNC]. Truro [45°22'N 63°16'W; CU, LEM].

**NT: T = 17** (8♂, 9♀). **FIRST RECORD:** 1♂, 1♀, Norman Wells, 23.vii.1949 (W.R.M. Mason) / (*Chrysopa chrysops* L., Det. P. Adams) [CNC]. **NEW RECORDS:** 4♂, 2♀, Norman Wells, 24.vi.1969 (G.E. Shewell) [CNC]. 1♂, Norman Wells, 25.vi.1969 (G.E. Shewell) [CNC]. 1♂, 2♀, Norman Wells, 27.vi.1969 (G.E. Shewell) [CNC]. **FLIGHT PERIOD:** June 16 (1950; Fort Smith)–July 23 (1949; Norman Wells). **LOCALITIES:** Fort Smith [60°00'N 111°53'W; CNC]. Norman Wells [65°16'55"N 126°49'45"W; CNC].

**ON: T = 84** (33♂, 44♀, 7?). **FIRST RECORD:** 1♀, Ottawa, 4.vi.1908 (J.A. Letourneau) / (*Chrysopa chrysops* L., Det. P. Adams) [CNC]. **NEW RECORDS:** 1♀, One Sided L[a]k[e], Larsson's Camp: 22.vi.1960 (M.R. MacKay) [CNC]. **FLIGHT PERIOD:** May 21 (1962; Ottawa)–August 7–8 (1960; Nestor Falls). **LOCALITIES:** Algoma [48°N, 84°W; CNC]. Algonquin P[ar]k, Head L[ake] [46°06'N 77°50'W; ROM, UG]. Algonquin P[ar]k, N[orth] Carson L[ake] [Carson Lake, 45°30'N 77°45'W; APM, ROM]. Bainsville [45°11'N 74°25'W; LEM]. Belwood [43°47'N 80°19'W; UG]. Biscotasing [47°17'N 82°06'W; CNC]. Blackburn [45°26'N 75°33'W; UG]. Britannia [45°21'46"N 75°47'40"W; CNC]. Brooklin [43°57'N 78°57'W; UG]. Burke Falls [Burk's Falls, 45°37'N 79°24'W; CNC]. Calabogie, 2 mi[les] SE, Cedar Point Lodge [45°18'N 76°43'W; ROM]. Cochrane [49°09'N 81°02'W; CNC]. Cumberland [45°31'N 75°24'W; UG]. Favourable L[ake] [53°03'N 93°20'W; ROM]. Finland [48°51'N 93°55'W; CNC]. Go Home Bay [44°59'N 79°56'W; CNC]. Guelph [43°33'N 80°15'W; UG]. Harris Hill [48°56'34"N 94°32'26"W; CNC]. Hornings Mills [44°09'N 80°12'W; ROM]. Islington [43°38'27"N 79°32'54"W; MCZ]. Kendal [44°02'N 78°32'W; ROM]. Kenora [49°49'N 94°26'W; CNC]. Lake Nipissing [46°17'N 80°00'W; ROM]. L[ake] Opeongo, Algonquin P[ar]k [Opeongo Lake, 45°42'N 78°23'W; MCMU]. Leskard [44°02'N 78°39'W; ROM]. Marmora [44°29'N

31. Label data without gender provided by L.L. Pechuman *in litt.* 1980.



77°41'W; UG]. Merivale [45°19'N 75°43'W; CNC]. Miner's Bay [Miners Bay, 44°49'N 78°46'W; CNC]. Minnitaki [49°48'59"N 93°05'30"W; CNC]. Nipigon [Nipigon, 49°01'N 88°16'W; ROM]. Nestor Falls [49°07'N 93°56'W; CNC]. Ogoki [51°38'N 85°57'W; CNC]. One Sided Lake<sup>32</sup> / One Sided Lake, Larsson's Camp / One Sided L[a]k[e], Larsson's Camp [Claxton Township, Rainy River District<sup>33</sup>, 49°03'N 93°54'W; CNC, ROM]. Orono [43°59'N 78°37'W; ROM]. Ottawa [45°16'N 75°45'W; CNC, UG]. Plantagenet, Prescott Co[unty] [45°31'57"N 74°59'40"W; ROM]. Quetico Prov[incial] P[ar]k, Rainy R[iver] District, 5 mi[les] E, campground on R[ou]t[e] 11 [48°25'N 91°35'W; ROM]. Rushing R[iver] Prov[incial] P[ar]k, Kenora District [49°41'N 94°14'W; ROM]. Sand Lake [conflicting place names; CNC]. Smoky Falls, Mattagami R[iver] [50°04'N 82°10'W; CNC]. S[outh] Neebing T[ownshi]p [Neebing, 48°10'N 89°25'W; ROM]. Thunder Bay [48°24'N 89°19'W; UG]. Timagami [Lake Temagami<sup>34</sup>, 46°58'N 80°05'W; ROM]. Toronto [43°42'N 79°25'W; ROM]. Vermilion Bay [49°51'19"N 93°24'07"W; CNC]. Waubamic [Waubamik, 45°27'N 80°01'W; CU].

**PE: T = 2** (♀). **FIRST RECORD:** 1♀, Alberton, 16.vii.1940 (G.S. Walley) / (*Chrysopa chrysops* L., Det. P. Adams) [CNC]. **FLIGHT PERIOD:** July 16 (1940; Alberton)–July 21 (1940; Dalvay House, Can[adian] Nat[ional] Park). **LOCALITIES:** Alberton [46°49'N 64°04'W; CNC]. Dalvay House<sup>35</sup>, Can[adian] Nat[ional] Park [Dalvay-by-the-Sea Hotel National Historic Site, 46°24'54"N 63°04'15"W; CNC].

**QC: T = 182** (76♂, 92♀, 14?). **FIRST RECORD:** 1♂, Chelsea, 25.vi.1912 (Arthur Gibson) / (*Chrysopa chrysops* L., Det. P. Adams) [CNC]. **NEW RECORDS:** 1♂, Aylmer, 24.v.1954 (B.P. Beirne) [CNC]. 1♀, Beechgrove, 45°39'N 76°08'W, 29.vi.1962 (J.R. Vockerth) [CNC]. 2♀, H[igh]w[a]y to James Bay, Malaise FIT<sup>36</sup>, *Salix* Bushes, km 66, 50°03'N 77°07'W, 12.vi–8.viii.1987 (L. LeBlank) [CNC]. 1♀, H[igh]w[a]y to James Bay, Malaise FIT, *Salix* Bushes, km 66, 50°03'N 77°07'W, 12.vi–8.viii.1987 [collector unknown; CNC]. **FLIGHT PERIOD:** May 24 (1954; Aylmer. 1975; Ste-Anne-de-Bellevue)–August 25 (1951; Lac-Mondor, Sainte-Flore). **LOCALITIES:** (unspecified) [UL Provancher Collection 1 and 2]. Avoca, Rouge River [45°43'N 74°42'W; LEM]. Aylmer [45°23'42"N 75°49'56"W; CNC]. Baie James [Baie-James, 52°00'N 76°00'W; UdeM]. Beechgrove, 45°39'N 76°08'W [Beech Grove; CNC]. Berthierville [46°05'N 73°11'W; UdeM]. Bic [Le Bic, 48°22'N 68°42'W; UdeM]. Cap Rouge [46°45'05"N 71°20'40"W; CNC]. Cascade [Cascades, 45°35'20"N 75°52'17"W; CNC]. Cascapedia / Cascapedia R[iver] [Cascapédia-Saint-Jules, 48°15'N 65°55'W; CNC]. Chelsea [45°30'N 75°47'W; CNC]. Chicoutimi [48°25'37"N 71°03'44"W; UQC]. Chicoutimi-Nord [48°27'N 71°04'W; UQC]. Covey Hill [45°01'06"N 73°45'20"W; CNC]. F[or]t Coulonge [45°51'N 76°44'W; CNC]. Foster, Brome Co[unty] [Foster, Brome-Missisquoi, 45°17'27"N 72°29'38"W; UQC]. Gaspé Co[unty] [La Côte-de-Gaspé, 49°10'N 64°55'W; CNC]. Georgeville [45°08'20"N 72°15'09"W; CNC]. H[igh]w[a]y to James Bay, km 66, 50°03'N 77°07'W<sup>37</sup> [CNC]. Hudson Heights [45°27'51"N 74°09'05"W; ZMUH]. Hull [Gatineau, 45°29'N 75°39'W; CU]. Ile Perrot [L'Île-Perrot, 45°23'N 73°57'W; LEM]. Kazabazua [45°57'N 76°01'W; CNC]. King M[oun]t[ain] / King M[oun]t[ain], Summit, Old Chelsea [Parc de la Gatineau, 45°34'N 75°57'W; CNC]. Kingsmere [45°29'27"N 75°50'31"W; CNC]. Knowlton [45°13'02"N 72°31'01"W; CNC]. Lac Cameron, Labelle Co[unty], 1 km N [Lac-Cameron, Amherst, Les Laurentides, 46°07'15"N 74°50'06"W; LEM]. Lac Mondor, S[ain]te Flore [Lac-Mondor, Sainte-Flore, 46°37'32"N 72°45'52"W; CNC]. Lacoste<sup>38</sup> [46°26'43"N 74°55'39"W; CNC]. Lac S[ain]t Louis, Station 7 [Lac-Saint-Louis, 46°33'40"N 73°48'20"W; UdeM]. Laniel [47°03'N 79°16'W; CNC]. Lanoraie [45°58'N 73°13'W; CNC, LEM]. La Trappe [Oka, Deux-Montagnes, 45°29'41"N 74°01'30"W; UdeM]. Laval [45°35'N 73°45'W; LEM]. Meach Lake [Lac-Meech, 45°31'35"N 75°52'25"W; CNC]. Megantic [Mégantic, District judiciaire, 45°35'N 70°53'W; CU]. Montfort, Laurentian M[oun]t[ain]s [45°53'10"N 74°20'23"W; CU]. Montigny [46°24'N 75°07'W; CNC]. Montreal / M[oun]t Royal [Montréal, 45°31'N 73°39'W; LEM]. M[oun]t Albert [Mont Albert, 48°55'N 66°11'W; CNC].

32. One Sided Lake, Rainy River District (Riotte 1992: 7).

33. J.E.H. Martin, personal communication [1980].

34. The specimen was captured on Bear Island, Lake Timagami [*sic*], according to Brown (1934).

35. Garland 1982 [1984]: 371, line 13: Delvay House, should read: Dalvay House; label is correct.

36. Malaise FIT = Malaise Flight Intercept Trap.

37. Point of Reference: Lac Matagami, 49°53'N 77°30'W; the site of collection was NE of there.

38. Lacoste QC: despite conflicting place names, other collections of *C. chi* by G.S. Walley in 1941 make the most likely place the one in Antoine-Labelle; cf. Lacoste [Antoine-Labelle], 6.vi.1941 (G.S. Walley) [CNC]. Montigny [Antoine-Labelle]: 9.vi.1941 (G.S. Walley) [CNC].

M[oun]t S[ain]t Hilaire / S[ain]t Hilaire [Saint-Hilaire, 45°33'30"N 73°11'54"W; CU, LEM]. Norway Bay [45°31'17"N 76°25'24"W; USNM]. Parc du Mont Tremblant / Parc du Mont Tremblant, Ruisseau Beattie [Mont-Tremblant, Parc national du, 46°26'N 74°21'W; UdeM]. Pincourt, Île Perrot [45°23'N 73°59'W; LEM]. Pointe-du-Moulin, Île Perrot [45°22'N 73°52'W; LEM]. Port Cartier, 107 mi[les] N [Port-Cartier, 50°02'N 66°52'W; UdeM]. Rigaud [45°29'N 74°18'W; LEM]. Rivington, Rouge R[iver], 6 mi[les] E [45°47'26"N 74°41'01"W; LEM]. Rougemont, Orchard 750 [45°26'N 73°03'W; CNC]. Routhierville [48°10'57"N 67°08'57"W; USNM]. S[ain]te Anne de Bellevue / Morgan Woods [Morgan Arboretum, Sainte-Anne-de-Bellevue, 45°24'11"N 73°56'58"W; LEM]. S[ain]te Clotilde [Sainte-Clotilde-de-Châteauguay, 45°09'29"N 73°40'42"W; SJRS]. S[ain]te Foy [Sainte-Foy-Sillery, 46°46'15"N 71°17'00"W; CRFL, CSQ]. S[ain]t Hippolyte [Saint-Hippolyte, 45°56'N 74°01'W; UdeM]. S[ain]t Théodore de Chertsey [Saint-Théodore-de-Chertsey, 46°04'20"N 73°53'13"W; LEM]. Shawbridge [45°52'17"N 74°04'45"W; LEM]. Sherbrooke [45°24'N 71°54'W; CU]. Val-Cartier [Valcartier, 46°53'20"N 71°30'20"W; UL]. Wright [46°05'N 76°05'W; CNC].

**SK: T = 20** (10♂, 7♀, 3?). **FIRST RECORD:** 1♀, Prince Albert, 23.vi.1913 (E.M.W[alker]) / (*Chrysopa chrysops* L., Det. P. Adams) [ROM]. **NEW RECORDS:** 1♀, Prince Albert, Nursery, 8.vii.1968 (J.A. Garland) / (collected at sunset on foliage of poplar stool) [NFRC]. **FLIGHT PERIOD:** May 24 (1923; Saskatoon)–August 8 (1973; Big River). **LOCALITIES:** Big River [53°50'N 107°01'W; UG]. Indian Head [50°32'N 103°40'W; IHTN]. Kenosee [Kenosee Lake, 49°50'N 102°17'W; CNC]. La Ronge [55°06'N 105°17'W; SMNH]. Love [53°29'N 104°10'W; USS]. Milliken Lake, NW cor[ner] [59°27'N 108°45'W; SMNH]. Nesslin L[ake] [53°56'N 106°47'W; USS]. Prince Albert [53°12'N 105°46'W; CNC, NFRC, ROM]. Saskatoon [52°07'N 106°38'W; CNC].

**YK: T = 31** (17♂, 15♀). **FIRST RECORD:** 1♂, Dawson, 21.vi.1949 (W.W. Judd) / (*Chrysopa chrysops* L., Det. P. Adams) [CNC]. **NEW RECORDS:** 1♀, Dawson, 14 mi[les] E, 1300 ft [396 m], 30.vii.1962 (P.J. Skitsko) [CNC]. 2♂, 1♀, Dempster J[un]ct[ion], 40 km E [of] Dawson, Willow-Spruce for[est], Malaise FIT<sup>39</sup>, 19.vi–25.viii.[19]84 (S. & J. Peck) [CNC]. **FLIGHT PERIOD:** June 15 (1979; Klondike Highway, McCabe Creek)–July 30 (1962; Dawson). **LOCALITIES:** Dawson / Dawson, 14 mi[les] E [64°03'45"N 139°25'50"W; CNC]. Dempster H[igh]w[a]y, Flat Cr[ee]k, 1 km E, 63°57'N 138°37'W [ROM]. Dempster J[un]ct[ion], 40 km E [of] Dawson [Dawson, 64°03'45"N 139°25'50"W; CNC]. Klondike H[igh]w[a]y, McCabe Cr[ee]k, 62°32'N 136°45'W [ROM]. Klondike H[igh]w[a]y, Pelly X-ing [Crossing], 466 km, campground, 62°49'N 136°35'W [ROM].

#### UNITED STATES:

**AK: T = 6** (5♂, 1♀). **FIRST RECORD:** 1♂, 1♀, Richard[son] H[igh]w[a]y, mile 290, 19.vi.1951 (Mason & McGillis) / (*Chrysopa chrysops* L., Det. P. Adams) [CNC]. **NEW RECORDS:** 1♂, Anderson J[un]ct[ion], 11 mi[les] S, R[ou]t[e] 3, mi[le] 270, Alder, Poplar, Spruce, Malaise FIT<sup>40</sup>, 23.vi–11.viii.[19]84 (S. & J. Peck) [CNC]. 1♂, Houston, Spruce-Birch forest w[ith] moss, Malaise FIT, 24.vi–19.vii.[19]84 (S. & J. Peck) [CNC]. **FLIGHT PERIOD:** June 19 (1951; Richardson Highway, mile 290)–June 26 (1979; Fairbanks, Malaise trap<sup>41</sup>). **LOCALITIES:** Anderson J[un]ct[ion], 11 mi[les] S, R[ou]t[e] 3, mi[le] 270 [Anderson, 64°34'42"N 149°18'69"W; CNC]. Big Delta [64°10'N 145°55'W; CNC]. Fairbanks, powerline cut [64°50'N 147°50'W; NSM]. Houston [61°63'03"N 149°81'81"W; CNC]. Richard[son] H[igh]w[a]y, mile 290 [CNC].

*Chrysopa chi* has been found in all provinces and territories of Canada, except Nunavut, and in Alaska. A Finnish-Swedish team was the first to collect *C. chi* from Newfoundland and Labrador, in 1949 (Tjeder 1960). Canadian localities in literature for which no specimen has been seen, are: Departure Bay BC (Gibson 1914, as *Chrysopa ypsilon*), Teulon MB (Smith 1932, as *Chrysopa chi* var. *chi*), Blacksburg ON (Smith 1932, as *Chrysopa chi* var. *upsilon*), and Kitty's Brook NL (Tjeder 1960, as *Chrysopa chi*). All specimens reported here are documented with data in Garland (1982, 2000), or as new records (above). Based on label data, adults have been taken at light, in Malaise trap, at altitudes of 220–4200 ft [67–1280 m], on roadside plants, along a

39. Malaise FIT = Malaise Flight Intercept Trap.

40. Malaise FIT = Malaise Flight Intercept Trap.

41. The now-accepted convention is to date the specimen from the first trapping day.

road, a wood edge, the edge of a stream, a creek bottom, a clearing, a wet grassy marsh, a floodplain near a tamarack bog, an Alder thicket, a Willow-Spruce forest, a Spruce-Birch forest with moss, an hardwood forest, a cat-tail swamp, a tamarack bog, a marshy lake shore [with] brackish water and *Carex*, *Iris*, *Juncus*, and in mixed dry mesophytic woods; they have been collected at sunset on foliage of poplar stools in a tree nursery; and adults have been associated with Alder, Apple, Birch, Bur Oak, Pine pl[antation], Poplar, *Salix* (bushes), Spruce, Thimbleberry, W[hite] Poplar, White Spruce, and Willow; also, in literature pertaining to Canada, in long grass in shady spots (A.W.A. Brown 1934). Adults have been reared from larvae or cocoons found on: *PINUS CONTORTA*: Hazelton BC [FIS 1946, 46-662B, em[erged] (incubator) 4.iv.1947; cocoon pinned with specimen; CNC]. *PSEUDOTSUGA TAXIFOLIA*: Barriere BC [FIS 1946, 46-823D, em[erged] (incubator) 4.iv.1947; cocoon pinned with specimen; CNC]. *TSUGA HETEROPHYLLA*: Hazelton BC [FIS 1946, 46-809D, em[erged] (incubator) 4.iv.1947; cocoon pinned with specimen; CNC].<sup>42</sup>

### **CHRYSOPE COLORADENSIS Banks, 1895**

*Chrysopa coloradensis* Banks, 1895a: 314–315. Type: USA: Colorado (Fort Collins); monotypy; male, MCZ (Penny *et al.* 1997).

#### SYNONYMY PERTAINING TO CANADA

*Chrysopa coloradensis*: Gibson 1910: 127; 1914: 127; Smith 1932: 585, 601; Spencer 1942: 27; Garland 1982 [1984]: 149–152, 316–317, Figs. 51–53, 74, Map 11; 1984: 93; 1985a: 737–751; Penny *et al.* 1997: 49; Garland 2000: 39.

**CANADA: T = 123** (59♂, 60♀, 4?). **FIRST RECORD:** BC: 1 ?, Kaslo, 17.vii.[19]03 (R.P. Currie) [USNM]. **FLIGHT PERIOD:** May 12 (1980; Kamloops BC)–September 18 (1976; Penticton BC).

**BC: T = 123** (59♂, 60♀, 4?). **FIRST RECORD:** 1 ?, Kaslo, 17.vii.[19]03 (R.P. Currie) [USNM]. **NEW RECORDS:** 1 ♀, Seton Lake, Lillooet, 2.vi.1926 (J. McDunnough) / [hand-written] (Det. Smith) / [type-written] (2916) / (*Chrysopa coloradensis* Banks, Det. P. Adams) [CNC]. 1 ♂, Richter Pass, Osoyoos, *Artemisia*, 24.v.1959 (R. Madge) / [type-written] (2889) / (*Chrysopa coloradensis* Banks, Det. P. Adams) [CNC]. 1 ♀, Oliver, swept fr[om] pine, 25.v.1959 (R. Madge) / [type-written] (2886) / (*Chrysopa coloradensis* Banks, Det. P. Adams) [CNC]. 1 ♀, Kamloops, on *P[inus] ponderosa*, 12.v.[19]80 (D. Evans) / [type-written] (260) [PFRC]. 1 ♀, Penticton, 8.ix.1985 (J.A. Garland) [CNC]. **FLIGHT PERIOD:** May 12 (1980; Kamloops)–September 18 (1976; Penticton). **LOCALITIES:** Cache Creek, 6 mi[les] E [50°48'N 121°19'W; LEM]. Creston [49°06'N 116°30'W; CNC]. Departure Bay [49°12'N 123°58'W; ROM]. Kamloops [50°40'N 120°19'W; PFRC, SEM]. Kaslo [49°55'N 116°55'W; USNM]. Keremeos [49°12'N 119°50'W; CNC]. Lytton, n[ea]r [50°14'N 121°34'W; SEM, UG]. Oliver [49°11'N 119°33'W; CNC]. Peachland [49°46'N 119°44'W; MCZ]. Penticton / Penticton, 2800–3000 ft [853–914 m, vicinity of Carmi Road E of Penticton] [49°30'N 119°35'W; CNC, LEM, SEM]. Penticton, West Bench [West Bench, 49°30'N 119°37'W; BCPM]. Richter Pass, Osoyoos [49°04'N 119°35'W; CNC]. Salmon Arm [50°42'N 119°16'W; CNC]. Seton Lake, Lillooet [50°41'N 122°07'W; CNC]. Vaseaux L[ake], Oliver [Vaseux Lake, 49°17'N 119°32'W; CNC<sup>43</sup>]. W[est] Sum[me]rland<sup>44</sup> [Summerland, 49°36'N 119°40'W; SEM]. Westbank [49°50'N 119°38'W; CNC]. White Lake, Oliver [49°19'N 119°38'W; CNC]. Winslow<sup>45</sup> [Trout Creek, 49°34'N 119°37'W; SEM].

*Chrysopa coloradensis* occurs in Canada, in British Columbia, on Vancouver Island and in the southern

42. In all three cases, larvae were collected in 1946, and adults emerged on April 4, 1947.

43. Record in Garland 1982 [1984]: p. 317, l. 12: 1 ♀, 15.v.1959 (R.E. Leech); should read: 1 ♂, *idem*. The sex of the specimen is hereby corrected; therefore, Garland 1982 [1984]: p. 152, should read: Examined from Canada.

Fifty-seven males, fifty-six females, four indeterminate; total 117 specimens.

44. West Summerland Station (15.3 km [Mile Zero is located at Penticton]). “Just before Victoria Road South intersects with Lenzi Street is the site of West Summerland Station and the main station for the Kettle Valley Steam Railway... Of the original station, the octagonal water tower foundation can be found beside the tracks 300 metres before the station.” (Langford 2002)

45. Winslow Station (11.3 km [Mile Zero is located at Penticton]). “Winslow Station was named after R. M. Winslow of the provincial department of Agriculture who was primarily responsible for the development of the Dominion Experimental Farm. It was established in 1914 to assist the development of the agricultural industry in the unique environmental conditions of the Okanagan Valley. The name was later changed to the Summerland Agricultural Research Station and borders the KVR at Winslow Station.” (Langford 2002)



interior. All Canadian localities reported in literature have been authenticated. All specimens reported here are documented with data in Garland (1982, 2000), or as new records (above). Based on label data, adults have been taken at light, and they have been associated with *Artemisia*, and Pine / *Pinus ponderosa*.

### **CHRYSOPE EXCEPTA Banks, 1911**

*Chrysopa excepta* Banks, 1911: 340. Type: USA: New Mexico (Fort Wingate); original designation; sex unknown, MCZ (Penny *et al.* 1997).

#### SYNONYMY PERTAINING TO CANADA

*Chrysopa excepta*: Smith 1932: 585; Spencer 1942: 27; Garland 1982 [1984]: 153–157, 317–318, Figs. 54–57, 73, Map 12; 1984: 93; 1985a: 737–751; Penny *et al.* 1997: 49.

**CANADA: T = 11** (5 ♂, 6 ♀). **FIRST RECORD**: BC: 1 ♀, Penticton, 7.vi.1919 (W.B. Anderson) / (Det. Smith) / (2923) / (*Chrysopa coloradensis* Banks, Det. P. Adams) / (*Chrysopa excepta* Banks, ♀, Det. J.A. Garland 1980) [CNC]. **FLIGHT PERIOD**: May 24 (1922; Nicola BC)–August 1 (1951; Elbow SK).

**AB: T = 2** (♂). **FIRST RECORD**: 1 ♂, Lethbridge, 7.vi.1922 (H.E. Gray) / (2971) / (*Chrysopa excepta* Bks., Det. P. Adams) [CNC]. **FLIGHT PERIOD**: June 7 (1922; Lethbridge)–July 25 (1952: Manyberries). **LOCALITIES**: Lethbridge [49°42'N 112°49'W; CNC]. Manyberries [49°24'N 110°42'W; CNC].

**BC: T = 3** (1 ♂, 2 ♀). **FIRST RECORD**: 1 ♀, Penticton, 7.vi.1919 (W.B. Anderson) / (Det. Smith) / (2923) / (*Chrysopa coloradensis* Banks, Det. P. Adams) / (*Chrysopa excepta* Banks, ♀, Det. J.A. Garland 1980) [CNC]. **NEW RECORDS**: 1 ♂, Oliver, 15.v.1923 (C.B. Garrett) / (Det. Smith) / (*Chrysopa ?excepta* Banks, Det. P. Adams) [CNC<sup>46</sup>]. **FLIGHT PERIOD**: May 24 (1922; Nicola)–June 7 (1919; Penticton). **LOCALITIES**: Nicola [50°10'N 120°40'W; CNC]. Oliver [49°11'N 119°33'W; CNC]. Penticton [49°30'N 119°35'W; CNC].

**SK: T = 6** (2 ♂, 4 ♀). **FIRST RECORD**: 1 ♂, Elbow, 1.viii.1951 (A.R. Brooks) / (2970) / (Adams Slide No. 6-III-625) / (Det. *Chrysopa excepta* Bks., Det. P. Adams) [CNC: 4 ♀, same primary data]. **FLIGHT PERIOD**: July 12 (1958; Lumsden)–August 1 (1951; Elbow). **LOCALITIES**: Elbow [51°07'N 106°35'W; CNC]. Lumsden [50°39'N 104°52'W; CNC].

*Chrysopa excepta* occurs in Canada, from the southern interior of British Columbia to south-central Saskatchewan. All Canadian localities reported in literature have been authenticated. All specimens reported here are documented with data in Garland (1982 [1984]), or as new records (above).

### **CHRYSOPE NIGRICORNIS Burmeister, 1839**

*Chrysopa nigricornis* Burmeister, 1839: 980. Type: NORTH AMERICA; original designation; male, Berlin (Penny *et al.* 1997).

#### SYNONYMY PERTAINING TO CANADA

*Chrysopa columbiana*: Smith 1932: 585; Spencer 1942: 27; Bickley and MacLeod 1956: 190 [part].

*Chrysopa crotchii*: Banks 1938: 76; Spencer 1942: 27; Bickley and MacLeod 1956: 197.

*Chrysopa majuscula*: Gibson 1912: 110; 1914: 127; Smith 1932: 597; Spencer 1942: 27; Bickley and MacLeod 1956: 195.

*Chrysopa lineaticornis*: Penny *et al.* 1997: 48 [part].

*Chrysopa nigricornis*: Provancher 1877a: 120–121; 1877b: 203, 205; Banks 1903: 149–150; Gibson 1912: 110; 1915: 149; Smith 1932: 584; Putman 1932b: 121–126; 1937: 29–37; Spencer 1942: 27; Garlick 1955: 282, 326–327, 329; Bickley and MacLeod 1956: 190; Bram and Bickley 1963: 9–10; Throne 1971: 69; Garland 1982 [1984]: 133–142, 308–314, Figs. 42–47, 73, 74, Map 9; 1984: 93; 1985a: 737–751; Penny *et al.* 1997: 49–50; Garland 2000: 39.

*Meleoma signoretti*: Smith 1932: 584 [part]; Spencer 1942: 26 [part].

**CANADA: T = 267** (122 ♂, 129 ♀, 16?). **FIRST RECORD**: QC: 1 ♂, Montreal, 21.vi.1875 (H.H. Lyman)

46. Recorded without data by Smith (1932) and Spencer (1942); specimen was not available to Garland (1982 [1984]: 156), but it has since been located (CNC).

[LEM<sup>47</sup>]. **FLIGHT PERIOD:** May 9 (1921; Victoria BC)–October 24 (1951; Montreal QC).

**AB: T = 4** (1♂, 3♀). **FIRST RECORD:** 1♀, Lethbridge, L[ight], 8.viii.1915 (E.H. Strickland) / (Det. Smith) [CNC]. **FLIGHT PERIOD:** June 18 (1929; Lethbridge)–August 8 (1915; Lethbridge). **LOCALITIES:** Elk Island N[ational] P[ark] [53°36'N 112°53'W; CNC]. Lethbridge [49°42'N 112°49'W; CNC].

**BC: T = 127** (50♂, 70♀, 7?). **FIRST RECORD:** 1♀, Bear Lake, 20.vii.1903 (R.P. Currie) [USNM]. **NEW RECORDS:** 1♂, 1♀, Minnie L[ake], 26.vii.1944 (E.R. Buckell) [CNC]. 1♀, Penticton, at light, 6.ix.1980 (S.G. Cannings) / (U.B.C. Coll. Vancouver) [SEM]. 1♂, Naramata, McPhee Road, vii–viii.1985 (J.A. Garland) [CNC]. 1♀, Osoyoos, East Bench, 12.x.2001 (G.G.E. Scudder) [SEM]. 1♀, Osoyoos, East Bench, attracted to light, 12.viii.2004 (G.G.E. Scudder) [SEM]. **FLIGHT PERIOD:** May 9 (1921; Victoria)–October 12 (1928; U.B.C., Vancouver / 2001; Osoyoos, East Bench). **LOCALITIES:** Agassiz [49°14'N 121°46'W; SEM]. Barker-ville [53°04'N 121°31'W; SEM]. Bear Lake<sup>48</sup> [40°03'N 117°12'W; USNM]. Cache Creek [50°48'N 121°19'W; SEM]. Cowichan Lake [48°52'N 124°16'W; SEM]. Departure Bay [49°12'N 123°58'W; CNC, ROM]. Esson-dale [49°14'N 122°49'W; SEM]. Galiano I[land], Spanish Hills [48°56'N 123°27'W; SEM]. Green Timbers For[estry] Sta[tion] [New Westminster Land District, 49°44'N 123°05'W; CNC]. Kamloops [50°40'N 120°19'W; SEM]. Kaslo [49°55'N 116°55'W; USNM]. Langford [48°27'N 123°30'W; PFRC]. Lillooet [50°41'N 121°56'W; CNC]. Minnie Lake [50°01'N 120°25'W; CNC]. Naramata, McPhee Road [Naramata, 49°36'N 119°35'W; CNC]. Okanagan Lake [49°45'N 119°44'W; SEM]. Oliver [49°11'N 119°33'W; CNC]. Osoyoos / Osoyoos, East Bench [49°02'N 119°27'W; CNC, SEM]. Penticton [49°30'N 119°35'W; LEM, SEM]. Pitt Meadow[s] [49°14'N 122°41'W; UG]. Quesnel [53°00'N 122°30'W; SEM]. Revelstoke [50°59'N 118°12'W; LEM]. Sullivan [49°07'N 122°48'W; SEM]. Summerland [49°36'N 119°40'W; SEM]. Terrace [54°31'N 128°36'W; MCZ]. Univ[ersity of British Columbia] [Vancouver, 49°15'N 123°07'W; MCZ]. Van-couver / Vanc[ouver] [49°15'N 123°07'W; BCPM, CNC, MCZ, SEM, UG]. Vernon [50°15'30"N 119°16'00"W; CNC]. Victoria [48°26'N 123°22'W; BCPM, CNC, MCZ<sup>49</sup>]. Westwick L[akes], Cariboo [52°00'N 122°10'W; SEM].

**MB: T = 22** (10♂, 11♀, 1?). **FIRST RECORD:** 1♀, Husavick [sic], 18.viii.1910 (J.B. Wallis) [MCZ]. **FLIGHT PERIOD:** May 20 (1980; University of Manitoba)–August 18 (1910; Husavik). **LOCALITIES:** Brandon [49°50'49"N 99°57'08"W; UMW]. Fort Garry [49°50'29"N 97°09'00"W; UMW]. Glenlea Res[earch] St[atio]n<sup>50</sup> [Glenlea, 49°38'08"N 97°08'06"W; LEM]. Husavick [Husavik, 50°33'47"N 96°59'34"W; MCZ]. Otto [50°39'29"N 97°48'57"W; CNC<sup>51</sup>]. S[ain]t James [49°53'09"N 97°14'34"W; UMW]. Stockton, 2 mi[les] W [49°35'22"N 99°27'11"W; CNC]. University of Manitoba [Fort Garry, 49°50'29"N 97°09'00"W; LEM]. Winnipeg [49°53'04"N 97°08'47"W; LEM, UMW].

**NB: T = 1** (♀). **FIRST RECORD:** 1♀, Gagetown, Fredericton, 12.vii.1932 (F.P. Ide) [ROM]. **FLIGHT PERIOD:** July 12 (1932; Gagetown, Fredericton). **LOCALITIES:** Gagetown, Fredericton [45°46'12"N 66°09'46"W; ROM].

**NS: T = 3** (♀). **FIRST RECORD:** 1♀, Willowdale, 9.vii.1947 (H.G. MacGillivray) / (3-28) / (U.N.B.28) / (2557) / (*Chrysopa nigricornis* Burm., Det. P. Adams) [CNC]. 1♀, Willowdale, Light, 9.vii.1947 (D.R. Redmond) / (3-48) / (U.N.B.48) / (2556) / (*Chrysopa nigricornis* Burm., Det. P. Adams) [CNC]. **FLIGHT PERIOD:** July 9 (1947; Willowdale)–August 29 (1952; Armdale). **LOCALITIES:** Armdale [44°38'N 63°38'W; USNM]. Willowdale [45°24'N 62°13'W; CNC].

**ON: T = 64** (30♂, 29♀, 5?). **FIRST RECORD:** 1♀, Ottawa, 15.vii.1907 (Arthur Gibson) [CNC]. **NEW**

47. This is the earliest definitely dated specimen of Chrysopidae from Canada; reported erroneously as *Chrysopa oculata* by Garland (1985a: 746).

48. Bear Lake, placed near Prince George by Garland (1982 [1984]: 139), is here corrected to the Kootenay Region based on information provided by Currie (1904), Dyar (1904: 781), and Flint 2002: 90).

49. *Chrysopa crotchii* Banks, 1938: 76. Type: 1♀, Victoria, vii (Crotch) [MCZ, No. 22975]; monotypy. Terminalia stored in glycerine in a microvial pinned below the specimen; examined and figured by Garland (1982 [1984]: 136; Figs. 44, 47).

50. The University of Manitoba's Glenlea Research Station is located just south of Winnipeg.

51. Cocoon attached to pin (FIS, W-369A).

**RECORDS:** 1♂, S[ain]t Lawrence Is[lands] Nat[ional] Park, Mermaid Island / Code 4372-P, 9.viii.1976 (Carter) [CNC]. 1♂, S[ain]t Lawrence Is[lands] Nat[ional] Park, McDonald Is[land] / Code 4417-Y, 14.viii.1976 (Carter) [CNC]. **FLIGHT PERIOD:** May 18 (1962; Toronto)-October 6 (1908<sup>52</sup>; Ottawa). **LOCALITIES:** Biscotasing [47°17'N 82°06'W; CNC]. Black Rapids, Rideau R[iver] [Carleton County, 45°19'N 75°42'W; CNC]. Brantford [43°08'N 80°16'W; MCMU]. Burlington [43°23'10"N 79°50'15"W; MCMU]. C[entral] E[xperimental] F[arm] [Ottawa, 45°16'N 75°45'W; CNC, UAE]. Chaffey's Locks [44°35'N 76°19'W; ROM]. Chatham [42°24'N 82°11'W; UWO]. De Grassi P[oin]t [44°15'N 79°32'W; ROM]. Fennala [Fenella, 44°09'N 78°05'W; UG]. Hamilton [43°14'N 79°57'W; MCMU]. Horning's Mills [44°09'N 80°12'W; ROM]. L[ake] Couchiching [44°40'N 79°22'W; ROM]. McIntyre [conflicting place names; ROM]. Niagara-on-Lake [Niagara-on-the-Lake, 43°15'N 79°04'W; UG]. Norval [43°39'N 79°51'W; UG]. Orillia [44°37'N 79°25'W; CNC]. Ottawa / Ottawa West [45°16'N 75°45'W; CNC]. P[oin]t Pelee [Point Pelee National Park of Canada, 49°58'N 82°31'W; CNC, ROM]. Port Arthur [Thunder Bay, 48°24'N 89°19'W; MCMU]. Port Credit [43°33'N 79°35'W; ROM]. Rondeau Prov[incial] P[ar]k, Kent Co[unty] [42°17'N 81°52'W; ROM]. S[ain]t Davids [43°10'N 79°07'W; UG]. S[ain]t Lawrence Is[lands] Nat[ional] Park, McDonald Is[land], Code 4417-Y [McDonald Island, 44°19'N 76°10'W; CNC]. S[ain]t Lawrence Is[lands] Nat[ional] Park, Mermaid Island, Code 4372-P [Mermaid Island, 44°18'N 76°11'W; CNC]. Severn Bridge [44°46'N 79°20'W; ROM]. Stittsville [45°15'N 75°55'W; MCMU]. Tillsonburg [42°51'N 80°44'W; CNC]. Toronto [43°42'N 79°25'W; ROM]. Vineland [43°09'N 79°24'W; CNC]. Zion [Thorndale<sup>53</sup>, 43°06'N 81°08'W; UWO].

**QC: T = 43** (29♂, 11♀, 3?). **FIRST RECORD:** 1♂, Montreal, 21.vi.1875 (H.H. Lyman) [LEM]. **NEW RECORDS:** 1♂, Laval, 21.vi.[19]84 (A.C. Sheppard) [CNC]. **FLIGHT PERIOD:** June 6 (1968; Saint-Félix-de-Kingsey)-October 24 (1951; Montréal). **LOCALITIES:** (unspecified) [UL Provancher Collection 1 and 2]. Berthierville [46°05'N 73°11'W; UdeM]. Duchesnay [Duchesnay, Barrage de, 46°52'02"N 71°38'15"W; CSQ]. Kirks Ferry [Kirk's Ferry, 45°32'30"N 75°49'00"W; CNC]. Knowlton [45°13'02"N 72°31'01"W; CNC]. Lachine [45°26'03"N 73°41'04"W; CNC]. Lac Mercier [conflicting place names; CNC]. Lac Mondor, S[ain]te Flore [Lac-Mondor, Sainte-Flore, 46°37'32"N 72°45'52"W; CNC]. L[ac] Victor [Lac-Victor, 47°24'N 76°09'W; CNC]. Lanoraie [45°58'N 73°13'W; LEM]. Laval [45°35'N 73°45'W; CNC, LEM]. Montreal [Montréal, 45°30'N 73°36'W; LEM]. Mont S[ain]t Hilaire [Saint-Hilaire, 45°33'30"N 73°11'54"W; LEM]. Parc du Mont Tremblant [Mont-Tremblant, Parc national du, 46°26'N 74°21'W; UdeM]. S[ain]te Anne de Bellevue [Sainte-Anne-de-Bellevue, 45°24'N 73°56'W; LEM]. S[ain]te Clotilde [Sainte-Clotilde-de-Châteauguay, 45°09'29"N 73°40'42"W; SJRS]. S[ain]te Foy [Sainte-Foy-Sillery, 46°46'15"N 71°17'00"W; UL]. S[ain]t Felix de Kinsey [Saint-Félix-de-Kingsey, 45°47'43"N 72°11'33"W; CRFL]. S[ain]t Johns Co[unty] [conflicting place names; LEM]. Shawbridge [45°52'17"N 74°04'45"W; LEM].

**SK: T = 3** (2♂, 1♀). **FIRST RECORD:** 1♂, Prairie River, Host ?, 10.vii.1946 (FIS, W-439) [collector unknown] / (*Chrysopa nigricornis* Burm., McGuffin) / (556) / (*Chrysopa nigricornis* Burm., Det. P. Adams) [CNC]. **NEW RECORDS:** 1♀, Meunster [sic], (F.I.S. [W67] 2265, Rec[eived] 24-7-[19]67) [collector unknown] / (White Elm, W67-2265) / [type-written] (10) / (*Chrysopa nigricornis* Burm., J.E.M.) [NFRFC]. **FLIGHT PERIOD:** July 9 (1956; Sutherland)-July 24 (1967; Muenster). **LOCALITIES:** Meunster [sic] [Muenster, 52°12'N 105°00'W; NFRFC]. Prairie River [52°52'N 102°59'W; CNC]. Sutherland [52°08'20"N 106°36'10"W; CNC].

*Chrysopa nigricornis* has been found in all provinces of Canada except Newfoundland and Labrador, and Prince Edward Island. Other names in literature for this insect in Canada are provided in the synonymy pertaining to Canada; three of them merit comment here:

*Ceraeochrysa lineaticornis*: Penny *et al.* (1997: 48, part [BC]) based their entry on Smith's (1932) *Chrysopa columbiana*, without consulting museum specimens.

*Chrysopa columbiana*: Smith (1932: 585) reported a female from Oliver BC with data as *C. columbiana*,

52. Date in Garland (1982 [1984]: 312) reads: 6.x.1902, but should read: 6.x.1908; this is reinterpreted here because the label, pre-printed 1905, has '8' written in ink over the '5' in 1905.

53. Zion, where W.C. McGuffin, the collector, grew up, is near Thorndale (K. Bolte, e-mail 7/25/05).

also cited by Spencer (1942: 27) and by Bickley and MacLeod (1956: 190). A specimen so-labelled by Smith could not be located (Garland 1982 [1984]: 137). However, a female with the same data exists, but it is an example of *Chrysopa nigricornis* (see next).

*Meleoma signoretti*: Smith (1932: 584) reported a female from Oliver BC, with data, as *Meleoma signoretti*, also cited by Spencer (1942: 26). The specimen is an example of *Chrysopa nigricornis* (Garland 1982 [1984]: 134, 140; CNC). Smith's label pinned with the specimen identifies it as his *Meleoma signoretti*.

Canadian localities in literature for which no specimen has been seen, are: Grimsby ON (Putman 1932b), Hemmingford QC (Smith 1932), and Sherbrooke QC (Banks 1903). All specimens reported here are documented with data in Garland (1982, 2000), or as new records (above). Based on label data, adults have been taken at light and in Malaise trap, swept from grass, associated with Alder, American or White Elm, Larch, Spruce, and Pine, and found in a Spruce-sand community, or reared from larvae found on *Fraxinus americana* [Ash] and Maple. In spite of its large size, this lacewing is able to elude even the most experienced collector; for instance, this species moves upward when disturbed, flying high into the boughs of tall trees, and at lights it has been found resting high on the wall, making it difficult to collect in such situations. Biology and immatures of this species, i.e., egg, larva and cocoon, were studied in California (Toschi 1965).

### **CHRYSOPA OCULATA Say, 1839**

*Chrysopa oculata* Say, 1839: 45. Type: USA; sex and depository unknown (Penny *et al.* 1997). No lectotype designated.

#### **SYNONYMY PERTAINING TO CANADA**

*Chrysopa* sp.: Downes 1974: 122 (part: second of two larvae, and figures).

*Chrysopa albicornis*: Provancher 1877a: 119; 1877b: 203, 204; Brodie and White 1883; Briand 1931: 123–126.

*Chrysopa assimilis*: Gibson 1914: 127; Smith 1932: 590.

*Chrysopa chi*: Robinson 1952: 36.

*Chrysopa chlorophana*: Walker 1853: 259–260; Banks 1903: 147–148; Anonymous 1906: 3; Gibson 1910: 127; 1913: 137; 1914: 127.

*Chrysopa euryptera*: Provancher 1869: 140.

*Chrysopa illepida*: Provancher 1877a: 119; 1877b: 203–204; Brodie and White 1883.

*Chrysopa latipennis*: Walker 1853: 259; Hagen 1861: 214; Provancher 1877a: 120; 1877b: 203, 205; Brodie and White 1883; Banks 1892: 358.

*Chrysopa oculata*: Walker 1853: 260; Hagen 1861: 211; Provancher 1869: 140; 1871a: 142; 1871b: 269; Saunders 1875: 153; Provancher 1877a: 119; 1877b: 203–204; Brodie and White 1883; Banks 1903: 147; Gibson 1913: 137; Briand 1931: 123–126; Steenburgh 1931: 64; Smith 1932: 584 (footnote 4); Putman 1932a: 44–45; 1932b: 121–126; 1937: 29–37; Garlick 1955: 282, 326–327, 329; Bickley and MacLeod 1956: 191–192; Putman and Herne 1960: 200; Wilde 1962: 847; 1963: 48; Watson and Wilde 1963: 435–438; Wilde and Watson 1963: 958–959; McMullen and Jong 1967a: 35–36; 1967b: 1293; Westigard *et al.* 1968: 740; McMullen 1971: 34; Throne 1971: 69; Hagley 1975: 34–35; Madsen and Morgan 1975: 13–14; New 1975: 131–132; Hagley 1979: 17; Philogene and Chang 1979: 56; Garland 1982 [1984]: 158–181, 318–359, 412, Figs. 58–63, 73, Map 13; 1984: 93; 1985a: 737–753, 759; Nechols *et al.* 1987: ; Garland 1989: 181; Penny *et al.* 1997: 50–51; 2000: 39–40.

*Chrysopa oculata* var. *albicornis*: Smith 1932: 590; Spencer 1942: 27.

*Chrysopa oculata* var. *bipunctata*: Smith 1932: 589–590; Spencer 1942: 27.

*Chrysopa oculata* var. *carei*: Smith 1932: 588–589; W.J. Brown 1934: 141; Spencer 1942: 27.

*Chrysopa oculata* var. *chlorophana*: Smith 1932: 587–588; Spencer 1942: 27.

*Chrysopa oculata* var. *illepida*: Smith 1932: 590; Spencer 1942: 27.

*Chrysopa oculata* var. *oculata*: Smith 1932: 587, 601; Spencer 1942: 27.

*Chrysopa oculata* var. *separata*: Smith 1932: 590–591; Spencer 1942: 27.

*Chrysopa oculata* var. *xanthocephala*: Smith 1932: 589; Spencer 1942: 27.

*Chrysopa transmarina*: Hagen 1861: 213; Provancher 1869: 140; 1871a: 142; 1871b: 269; 1877a: 119–120; 1877b: 203–204; Brodie and White 1883; Banks 1892: 358.

*Chrysopoda oculata*: Dutilly 1946: 43.

*Hemerobius perla*: Gosse 1840 [1971]: 197–198; Provancher 1871a: 142, as l'*Hémérobe perle*.<sup>54</sup>

*Meleoma* species near *emuncta*: Smith 1932: 599.



# SYNONYMY PERTAINING TO USA-ALASKA

*Chrysopa oculata*: Garland 1982 [1984]: 318.

**CANADA: T = 2681** (1133♂, 1365♀, 183?) + 2 larvae. **FIRST RECORD**: BC: 1♀, Wellington, 6.viii.1897 [collector unknown; MCZ]. **NEW RECORDS**: Locality unknown: 1? [abdomen missing], (F.I.Survey 1938, Rec[ord No.] 4865, R[e]c[eive]d 2.viii.1938) [collector unknown] / (*Chrysopa oculata* var. *chlorophana* Burm., Det. W.C.M.<sup>55</sup>) / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / [type-written] (2525) / (*Chrysopa oculata* Say, Det. P. Adams) [CNC]. 1♀, (F.I.Survey 1939, Rec[ord No.] 9298, R[e]c[eive]d 13.ix.1939) [collector unknown] / (*Chrysopa oculata* var. *oculata* Say, Det. W.C.M.<sup>56</sup>) / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / [type-written] (2524) / (*Chrysopa oculata* Say, Det. P. Adams) [CNC]. 1♀, (R.I.F. [19]40, 4316 G, Reçu [Received] 16.vii [1940]) [collector unknown] / (*Chrysopa oculata* *chi* Fitch, WCM<sup>57</sup>) / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / [type-written] (2526) / (*Chrysopa oculata* Say, Det. P. Adams) [CNC]. 1♀, (F.I.Survey 1940, Rec[ord No.] 1498, R[e]c[eive]d 19.vii.1940) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / [type-written] (2527) / (*Chrysopa oculata* Say, Det. P. Adams) [CNC]. **INTERCEPTION RECORDS [NON-ENTRY]**: 1♀, (TCA [Trans Canada Airlines] Flight 857 from London Eng[land] & Prestwick Scot[land]-[to] Toronto, 12.viii.[19]61) [collector unknown] / (L1-587) / [paper disc, yellow] / [paper rectangle with a green and orange band at one end, inscribed] (3045) / (*Chrysopa oculata* Say, Det. P. Adams) [genitalia pinned with specimen in a plastic microvial; CNC]. **FLIGHT PERIOD**: May 3 (1923; Oliver BC)–October 30 (1956; Tews Falls ON).

**AB: T = 148** (69♂, 68♀, 11?) + 1 larva. **FIRST RECORD**: 1♀, High River, 1906 (Thos. Baird) / (*Chrysopa oculata* Say, Det. P. Adams) [CNC]. **NEW RECORDS**: 1♀, Hotchkiss, 17.vii.1940 (C.L. Neilson) / [type-written] (1032) [CNC]. 1♀, North Star, 17.vii.1940 (C.L. Neilson) / [type-written] (1034) [CNC]. 1♀, 3 [Three] Creeks, 17.vii.1940 (C.L. Neilson) / [type-written] (1031) [CNC]. 1♀, Cowley, 19.vi.1962 (K.C. Herrmann) [CNC]. 1♂, Lundbreck, 15–16.vi.1962 (K.C. Herrmann) [CNC]. 1? [abdomen damaged], Eisenhower J[un]ct[ion], Banff Nat[ional] P[ar]k, 15.viii.[19]67 (A.G. Raske, collector) / (*Pinus contorta* var. *latifolia*) [CNC]. 1♂, Kananaskis, For[est] Exp[eriment] Sta[tion], Seebe, 3.vii.1968 (H.J. Teskey) / [type-written] (Malaise trap) [CNC]. **FLIGHT PERIOD**: May 28 (1949; Seebe)–August 26 (1961; Grande Prairie). **LOCALITIES**: Banff [51°10'N 115°34'W; CAS, CU]. Banff-Jasper Highway, Eisenhower Junction<sup>58</sup>, 4700 ft [1433 m] [Castle Junction, 51°16'05"N 115°55'00"W; CNC61<sup>59</sup>]. Beaverlodge [55°13'N 119°26'W; CNC, UAE, UG]. Bilby [53°42'N 114°06'W; CAS, CU]. Br[oc]k L[ake] [53°49'N 114°50'W; UAE]. Calgary [51°03'N 114°05'W; CU, UAE]. Cowley [49°34'N 114°05'W; CNC]. Cypress Hills [Cypress Hills, Mountain in AB, 49°34'N 110°08'W; CNC, UAE, UMW]. Drumheller [51°24'30"N 112°38'40"W; CNC, UAE]. Edmonton [53°33'N 113°28'W; PIDAA, UAE]. Eisenhower J[un]ct[ion]<sup>60</sup>, Banff Nat[ional] P[ar]k [Castle Junction, 51°16'05"N 115°55'00"W; CNC]. Elkwater [49°40'N 110°17'W; CNC]. Elkwater Park [Cypress Hills Inter-provincial Park, 49°38'N 110°12'W; CNC]. Empress [50°57'N 110°00'W; CNC]. F[or]t Chipewyan [58°42'N 111°08'W; USS]. Grande Prairie [55°10'N 118°48'W; CNC]. High Prairie [55°26'N 116°29'W; CNC]. High River [50°35'N 113°52'W; CNC]. Hotchkiss [57°04'N 117°33'W; CNC]. Iron Springs [49°56'N 112°41'W;

54. Provancher 1871:a: 142, wrote: Le correspondant mentionne l'*Hémérobe perle*, mais cet insecte ne se trouve pas en Canada, pas même en Amérique, pensons-nous.

55. W.C.M. : W.C. McGuffin.

56. W.C.M. : W.C. McGuffin.

57. WCM : W.C. McGuffin.

58. Mount Eisenhower and Eisenhower Junction = now Castle Mountain and Castle Junction.

59. Record consists of a specimen with the following data: 1♀, 19.vii.1955 (J.R. McGillis) [CNC]. According to Bird *et al.* (1995: 11): "R. Coyles, J.R. McGillis and G.E. Shewell worked out of a camp at Eisenhower (Castle) Junction for the Entomology Branch of Agriculture Canada in the summer of 1955. All of them collected butterflies and other insects for deposit in the Canadian National Collection."

60. Mount Eisenhower and Eisenhower Junction = now Castle Mountain and Castle Junction.

CNC]. Johnston Canyon<sup>61</sup> Road, Banff Nat[ional] P[ar]k [Johnston Canyon, 51°15'N 115°50'W; ROM]. Kananaskis, For[est] Exp[eriment] Sta[tion], Seebe [Barrier Lake, 51°01'N 115°04'W; CNC]. Lac la Biche [54°46'N 111°58'W; CNC]. Lethbridge [49°42'N 112°49'W; CNC<sup>62</sup>, UAE, UdeM, UMW, USS]. Lundbreck [49°35'N 114°10'W; CNC]. Manyberries [49°24'N 110°42'W; CNC]. Medicine Hat [50°03'N 110°40'W; CNC, UAE]. North Star [56°51'N 117°38'W; CNC]. Okotoks [50°44'N 113°59'W; CAS]. Onewfour [49°07'N 110°28'W; CNC]. Oyen [51°22'N 110°28'W; UG]. Peace River [56°15'N 117°17'W; CNC]. Peace River District [Peace River Regional District, 56°40'N 122°45'W; CNC]. Pincher Creek [49°29'N 113°57'W; CNC]. Red Deer [52°16'N 113°48'W; CNC]. Rycroft [55°45'N 118°43'W; CNC]. Seebe [51°06'N 115°04'W; CNC]. Stettler [52°19'N 112°43'W; USS]. Steeveville [50°50'N 111°37'W; USS]. Sturgeon Lake [55°06'N 117°32'W; CNC]. 3 [Three] Creeks [56°21'N 117°05'W; CNC]. Tofield [53°22'N 112°40'W; UAE<sup>63</sup>]. Valleyview [55°04'N 117°17'W; CNC]. Wabamun [53°33'N 114°28'W; UAE<sup>64</sup>]. Waterton [Waterton Lakes National Park of Canada, 49°05'N 113°52'W; CNC, UAE]. Waterton Lakes Nat[ional] P[ar]k, Dardanelles, 4200 ft [1280 m] / Waterton Lakes Nat[ional] P[ar]k, Lineham L[a]k[e]s Trail, 5500 ft [1676 m] [Waterton Lakes National Park of Canada, 49°05'N 113°52'W; WLNP]. Wetaskiwin [52°58'N 113°22'W; LEM, UAE]. White Mud Creek, Edmonton [Whitemud Creek, 53°31'N 113°34'W; UAE]. Whitemud R[iver], Peace River District [56°40'N 117°10'W; CNC].

**BC: T = 813** (374♂, 403♀, 36?). **FIRST RECORD:** 1♀, Wellington, 6.viii.1897 [collector unknown; MCZ Banks Collection]. **NEW RECORDS:** 1♂, Vernon, 3.vi.1926 (M.H. Ruhmann) [BCPM]. 1♀, Rolla, 18.vi.[19]40 (C.L. Neilson) / [type-written] (1033) [CNC]. 1♂, Deer Bay, N[ear] Qualicum, 3.vii.[19]83 (A. Downs) [CNC]. 1♂, Cowichan L[ake], 29.vii.[19]83 (A. Downs) [CNC]. 2♂, 2♀, Penticton, 8–12.vii.1985 (J.A. Garland) [CNC]. 2♂, 2♀, Penticton, 24.vii.1985 (J.A. Garland) [CNC]. 2♂, 2♀, Blind Bay, M[alaise] t[rap], 12–31.vii.[19]86 (H. Goulet) [CNC]. **FLIGHT PERIOD:** May 3 (1923; Oliver)–October 21 (1937; Cowichan L[ake]). **LOCALITIES:** (unspecified) [UG]. Adams Lake [50°58'N 119°41'W; CNC]. Agassiz [49°14'N 121°46'W; CNC, SEM]. Alert Bay [50°35'N 126°55'W; SEM, UWO]. Aspen Grove [49°56'N 120°37'W; CNC]. Barriere [Barrière, 41°11'N 120°07'W; CNC]. Bevan [49°40'N 125°05'W; CNC]. Blind Bay [50°53'N 119°23'W; CNC]. Chilcotin [Chilcotin Training Area, 42°04'51"N 122°33'05"W; SEM]. Chilliwack [49°10'30"N 121°56'30"W; CNC]. Christina L[ake] [49°02'35"N 118°12'30"W; ROM]. Clinton / Clinton, Loon L[ake] R[oad], Fish Hatchery [51°05'N 121°35'W; CNC, ROM]. Comox [49°41'N 124°56'W; CNC]. Courtenay [49°41'N 124°59'W; USNM]. Cowichan Bay [48°44'N 123°37'W; CNC]. Cowichan L[ake] [48°52'N 124°16'W; CNC, SEM]. Cranbrook [49°30'N 115°46'W; CNC]. Creston / Creston, 5 mi[les] W [49°06'N 116°30'W; CNC<sup>65</sup>, SEM]. Cultus L[ake] Prov[incial] P[ar]k, Entrance Bay campground [49°03'N 121°58'W; ROM]. Cummings Lake [55°05'N 121°57'W; SEM]. Dawson Creek [55°46'N 120°14'W; CNC]. Deer Bay, N[ear] Qualicum [Deer Bay, 49°13'N 125°36'W; CNC]. Departure Bay [49°12'N 123°58'W; ROM, SEM]. Downie Creek, Selkirk M[oun]t[ain]s [51°30'N 118°22'W; CU]. Fort Nelson [58°48'20"N 122°41'50"W; SEM]. Fort S[ain]t John [56°15'N 120°51'W; CNC]. Galiano Is[land], Spanish Hills [48°56'N 123°27'W; SEM]. Garibaldi P[ar]k n[ear] Squamish, Diamond Head Trail, 3200 ft [975 m] [Garibaldi Park, 40°00'N 122°45'W; CNC]. Goldstream [Goldstream Land District, 48°26'00"N 123°35'30"W; SEM]. Grand Forks / Grand Forks, 9 mi[les] E [49°02'N 118°26'W; CNC]. Green Lake, Okanagan Falls [49°18'N 119°34'W; CNC]. Green Timbers For[estry] Sta[tion] [New Westminster Land District, 49°44'N 123°05'W; CNC]. Hagensborg [52°23'N 126°33'W; SEM]. Haney, Univ[ersity of] B[ritish] C[olumbia] Res[earch] For[est] [Garibaldi Park, 50°00'N 122°45'W; ROM]. Harrison Mills [49°15'N 121°57'W; CNC]. Hat Creek, 2900 ft [884 m] [50°53'N 121°24'W; SEM]. Hatzic Lake [49°11'N 122°14'W; CNC]. Hope, 15 mi[les] E

61. Johnston Canyon is located on the TransCanada Highway, 25 km northwest of Banff on the way to Castle Junction/Castle Mountain.

62. Includes Paratype of *Chrysopa oculata* var *carei* Smith.

63. Record includes a cocoon with a parasite (Garland 1982 [1984]: 169).

64. Record based on a third-instar larva; determined by C.A. Tauber *in litt.* 1981.

65. Includes Paratype of *Chrysopa oculata* var *carei* Smith.



[49°23'00"N 121°26'20"W; CNC]. Jesmond [SEM]. Kamloops [50°40'N 120°19'W; CNC, SEM]. Kaslo [49°55'N 116°55'W; USNM]. Kersley [52°49'N 122°25'W; SEM]. Kitwanga, 5 mi[les] W [55°06'N 128°04'W; SEM]. Ladysmith [48°59'N 123°49'W; SEM]. Lakelse L[ake] [Lakelse Lake Provincial Park, 54°23'N 128°31'W; SEM]. Lillooet [50°41'N 121°56'W; CNC]. Lytton [50°14'N 121°34'W; SEM]. MacGillivray [*sic*] Creek Game Reserve n[ea]r Chilliwack [McGillivray Slough, 49°07'35"N 122°05'35"W; CNC]. Miracle Beach n[ea]r Oyster River [Miracle Beach Provincial Park, 49°51'N 125°06'W; CNC]. Mission City [Mission, 49°08'N 122°18'W; CNC]. Nicomen Slough [49°11'N 122°07'W; ROM]. Nanaimo [49°10'N 123°56'W; CAS, SEM]. Nelson [49°30'N 117°17'W; JEC, CNC]. N[ew] West[minster] [49°13'N 122°55'W; UWO]. New Westminster Forestry Station [Green Timbers Forestry Station, New Westminster Land District, 49°44'N 123°05'W; CNC]. Nicola [50°10'N 120°40'W; CNC]. North Vancouver [49°19'N 123°04'W; BCPM]. O[kanagan] F[alls], 5 mi[les] W, White L[ake] [White Lake, 49°19'N 119°38'W; CNC]. Oliver / Oliver, 1000 ft [305 m] / Oliver, 7 mi[les] N [49°11'N 119°33'W; CNC, SEM]. 100 Mile House [51°39'N 121°17'W; CNC, SEM]. Osoyoos / Osoyoos, Road 22 [49°02'N 119°27'W; BCPM, SEM]. Osoyoos L[ake] N[orth] [49°02'N 119°27'W; BCPM, SEM]. Paul L[ake] Road, 2¼ mi[les] W [of] cut-off to Lolo M[oun]t[ain] [Paul Lake, 50°44'N 120°07'W; ROM]. Pavilion Lake [50°52'N 121°44'W; CNC]. Pavilion Lake, M[oun]t[ain] [Pavilion Mountain, 50°59'N 121°41'W; SEM]. Penticton [49°30'N 119°35'W; CNC, LEM]. Penticton, West Bench [West Bench, 49°30'N 119°37'W; BCPM]. Pitt Meadows [49°14'N 122°41'W; CNC]. P[oin]t Holmes, Comox [Holmes Point, 51°06'N 127°28'W; CNC]. Pouce Coupe [55°43'N 120°08'W; CNC<sup>66</sup>]. Prince George [53°55'N 122°45'W; SEM]. Qualicum [Qualicum Bay, 49°24'N 124°38'W; CNC]. Quesnel [53°00'N 122°30'W; SEM]. Radium [50°37'N 116°06'W; SEM]. Revelstoke [50°59'N 118°12'W; CNC, CU, LEM]. Rolla [55°54'N 120°08'W; CN<sup>67</sup>]. Rossland, 8 mi[les] W [49°05'N 117°48'W; CNC]. Ruskin [49°12'N 122°26'W; CNC]. Saanich [48°33'N 123°22'W; SEM]. Salmon Arm [50°42'N 119°16'W; CNC]. Saratoga B[ea]ch, Oyster R[iver], Vanc[ouver] Is[land] [49°52'N 125°07'W; CNC]. Seton Lake, Lillooet [50°41'N 122°07'W; CNC]. Shawnigan Lake [48°39'28"N 123°37'35"W; ROM]. Smithers [54°46'50"N 127°10'15"W; SEM]. Soda Creek [52°21'N 122°17'W; SEM]. South Okanagan [unspecified locality; CNC, SDARS]. Spring Creek, Terrace [54°32'N 128°39'W; CNC]. Sproat Lake [49°17'N 124°55'W; CNC]. Squamish [near], Diamond Head Trail, 3200–3700 ft [975–1128 m] [Garibaldi Park, 40°00'N 122°45'W; CNC]. Strathnaver [53°20'50"N 122°32'55"W; SEM]. Summerland [49°36'N 119°40'W; CNC, SEM]. Summerland, Research Station [Trout Creek, 49°34'N 119°37'W; SDARS]. Taylor [Taylor Landing Park, 56°08'N 120°39'W; CNC]. Terrace / Terrace, 220 ft [67 m] / Terrace, 6 mi[les] W, Gagnon Road / Terrace, 10 mi[les] W [54°31'N 128°36'W; CNC, USNM]. Tofino, n[ea]r, on H[igh]w[a]y 4 [49°07'N 125°53'W; ROM]. Tranquille [50°42'N 120°31'W; CNC]. U[niversity of] B[ritish] C[olumbia] [Vancouver, 49°15'N 123°07'W; MCZ, SEM]. Vancouver [49°15'N 123°07'W; SEM]. Vanderhoof, 45 km E [Vanderhoof, 54°01'N 124°01'W; SEM]. Vaseaux L[ake], Oliver [Vaseux Lake, 49°17'N 119°32'W; CNC]. Vernon / Vernon, 2000 ft [610 m] / Vernon, Irish Creek Road [50°15'30"N 119°16'00"W; BCPM, CNC, SEM]. Vernon, Goose Lake [50°19'N 119°17'W; BCPM]. Victoria [48°26'N 123°22'W; CNC, SEM]. Wellington [49°12'N 124°02'W; CNC, MCZ]. W[est] Crescent Valley, 3000 ft [914 m], 49°24'N 117°39'W [SEM]. White Lake, Oliver [49°19'N 119°38'W; CNC]. Winslow<sup>68</sup> [Trout Creek, 49°34'N 119°37'W; SEM].

**MB: T = 223** (88♂, 89♀, 46?). **FIRST RECORD:** 1♂, Treesbank, 24.vii.[19]10 (J.B. Wallis) / (*Chrysopa chlorophana* Teste Banks) / (*Chrysopa oculata* Say, Det. P. Adams) [CNC]. **NEW RECORDS:** 1♀, Lake Winipeg, Grand Beach, 21.vii.[19]74 (M.J. & C.A. Tauber, Collectors) / (M.J. & C.A. Tauber Lot 97:13)

66. Includes Paratype of *Chrysopa oculata* var *carei* Smith.

67. Includes Paratype of *Chrysopa oculata* var *carei* Smith.

68. Winslow Station (11.3 km [Mile Zero is located at Penticton]). “Winslow Station was named after R. M. Winslow of the provincial department of Agriculture who was primarily responsible for the development of the Dominion Experimental Farm. It was established in 1914 to assist the development of the agricultural industry in the unique environmental conditions of the Okanagan Valley. The name was later changed to the Summerland Agricultural Research Station and borders the K[ettle] V[alley] R[ailway] at Winslow Station.” (Langford 2002)

[TAUBER<sup>69</sup>]. 42? [males and females], Lake Winnipeg, Grand Beach<sup>70</sup> / (lab-reared [1974], M.J. & C.A. Tauber Lot 97:13) [TAUBER<sup>71</sup>]. 2♂, 1♀, Maple Leaf Prov[incial] C[a]mpg[rou]nd, 6 mi[les] E [of] Portage la Prairie, ix.[19]72 (M.K. Kennedy, Coll[ector]) [TAUBER<sup>72</sup>]. 2♀, Rennie, Light Trap, 17-7-1961 [collector unknown] [NFRC]. 1♀, Rennie, (F.I.S., 27-7-[19]61) [collector unknown] / (*Larix laricina*, B, 27-7-61) [NFRC]. 1♂, Reston, Rec[eived] 8-7-66 [8.vii.1966], FIS 1380 / (*Picea glauca*, W 66, 1380) / [type-written] (6) [collector unknown; CNC]. 1? [abdomen missing], Sandilands, (F.I.S.: W-, 28.vii.[19]38) [collector unknown] [NFRC]. 2♂, Winkler, 24.viii.[19]49 (W.R. Allen) [NFRC]. 1♀, Winkler, 24.viii.[19]49 (W.R. Allen) / (*Chrysopa chi* Fitch, E.M. 1950) [NFRC]. **FLIGHT PERIOD:** May 22 (1958; Stockton, 2 mi[les] W)–September 23 (1978; Elma). **LOCALITIES:** Aweme [49°42'31"N 99°36'10"W; CNC]. Bald Head Hills, 13 mi[les] N [of] Glenboro [Bald Head Hills, Mountain, 49°40'52"N 99°18'18"W; CNC]. Beaconia [50°26'44"N 96°33'27"W; UMW]. Brandon [49°50'49"N 99°57'08"W; CNC, LEM, UMW]. Brandon, 6 mi[les] N [Forrest, 49°57'59"N 99°56'12"W; CNC]. Carberry / Carberry, 5 mi[les] W [49°52'08"N 99°21'34"W; CNC]. Dauphin [51°08'58"N 100°02'58"W; CNC]. Elma [49°52'30"N 95°54'29"W; UMW]. Flin Flon [54°46'05"N 101°51'51"W; UMW]. Forrest, 2 mi[les] N / Forrest, 9 mi[les] N [49°57'59"N 99°56'12"W; CNC]. F[or]t Garry [49°50'29"N 97°09'00"W; NFRC]. Gillam [56°27'30"N 94°12'30"W; CNC]. Glenlea Res[earch] Sta[tion]<sup>73</sup> [Glenlea, 49°38'08"N 97°08'06"W; LEM, UMW<sup>74</sup>]. Katherine L[ake], Riding M[oun]t[ain] Nat[ional] P[ark] [50°39'30"N 99°53'40"W; ROM]. Lake Winnipeg, Grand Beach [Grand Beach, 50°33'15"N 96°38'00"W; TAUBER<sup>75</sup>]. Le Pas [The Pas, 53°49'30"N 101°15'12"W; CNC]. Lockport [50°04'59"N 96°56'40"W; UMW]. Maple Leaf Prov[incial] C[a]mpg[rou]nd, 6 mi[les] E [of] Portage la Prairie [Portage la Prairie, 49°58'22"N 98°17'31"W; TAUBER<sup>76</sup>]. Minitonas [52°05'10"N 101°02'21"W; MMMN]. Minnedosa, 5 mi[les] N [50°14'43"N 99°50'34"W; CNC]. Morden [49°11'31"N 99°06'02"W; CNC, UMW]. Ninette [49°24'00"N 99°37'43"W; CNC]. Norgate, 5 mi[les] W [50°40'59"N 99°28'10"W; CNC]. Pilot Mound [49°12'05"N 98°53'38"W; CNC]. Portage [Portage la Prairie, 49°58'22"N 98°17'31"W; UMW]. Rennie [49°51'10"N 95°33'10"W; NFRC]. Reston [49°33'27"N 101°05'36"W; CNC]. R[iding] M[ountain] N[at]ional P[ark] [50°53'N 100°15'W; CNC]. Sandilands [49°19'28"N 96°17'47"W; MMMN, NFRC, UMW]. Shilo, 3 mi[les] S / Shilo, 3 mi[les] SW / Shilo, 5 mi[les] SW [49°48'20"N 99°38'28"W; CNC]. Sprague [49°02'07"N 95°38'21"W; CNC]. Stockton / Stockton, 2 mi[les] W [49°35'22"N 99°27'11"W; CNC]. Transcona [49°53'44"N 97°00'19"W; MMMN]. Treesbank [49°38'10"N 99°36'34"W; CNC]. University of Manitoba [Fort Garry, 49°50'29"N 97°09'00"W; UMW]. Wanless [54°10'42"N 101°21'39"W; CNC]. Whitewater L[ake], 4 mi[les] N [of] Whitewater [49°14'59"N 100°18'32"W; CNC]. Winkler [49°,10'54"N 97°,56'25"W; NFRC]. Winnipeg [49°53'04"N 97°08'47"W; CNC, NFRC, ROM, UMW, USS].

**NB: T = 46** (22♂, 20♀, 4?). **FIRST RECORD:** 1♂, Fredericton, 1\_.vi.1931 (R.P. Gorham) / (*Chrysopa oculata* Say, Det. P. Adams) [CNC]. **NEW RECORDS:** 1♂, Kouchibouguac N[at]ional P[ark], Code 5479S, 4.vii.1977 (J.D. Lafontaine) [CNC]. 1♀, Kouchibouguac N[at]ional P[ark], Code 5496J, 6.vii.1977 (J.D. Lafontaine) [CNC]. **FLIGHT PERIOD:** June 3 (1948; Canterbury)–September 1 (1956; Jacquet Head, Restigouche County). **LOCALITIES:** Ashton [Ashton Hill, 47°06'N 65°44'W; NDFRC]. Bathurst [47°37'34"N 65°37'42"W; CNC]. Canterbury [45°53'43"N 67°28'08"W; CNC]. Chipman [46°10'09"N 65°53'06"W; NDFRC]. Fredericton / F[rederic]ton [45°56'43"N 66°40'00"W; CNC, MFRC, ROM]. Fundy [Fundy National Park of Canada, 45°37'N 65°02'W; NDFRC]. Gr[een] River / Green River [47°19'N 68°09'W; CNC]. Jacquet Head, Restigouche County / Ja[c]quet Head, Restigouche, Field Station [Jacquet River, 47°55'N 66°00'W; CNC, LEM]. Kouchibouguac<sup>77</sup> N[at]ional P[ark], Codes 5479S / 5496J / 7188L [Kouchibouguac

69. Label data provided by C.A. Tauber *in litt.* 2006.

70. Grand Beach MB: source of study material reported in: C.A. Tauber and Tauber 1982; also in: Nechols *et al.* 1987; voucher specimens are documented here.

71. Label data provided by C.A. Tauber *in litt.* 2006.

72. Label data provided by C.A. Tauber *in litt.* 2006.

73. The University of Manitoba's Glenlea Research Station is located just south of Winnipeg.

74. Record includes three cocoons with Chalcidae (Hymenoptera).

75. Label data provided by C.A. Tauber *in litt.* 2006.

76. Label data provided by C.A. Tauber *in litt.* 2006.

National Park of Canada, 46°51'30"N 64°58'30"W; CNC]. Nictau [47°14'N 67°09'W; CNC]. Oak Bay [45°14'N 67°12'W; NDFRC]. Petitcodiac [45°56'21"N 65°10'53"W; USNM]. S[ain]t Andrews [45°05'04"N 67°03'46"W; CNC]. S[ain]t John [45°15'33"N 66°02'20"W; UG]. S[ain]t Quentin [Saint-Quentin, 47°30'36"N 67°23'19"W; NDFRC]. Sussex [45°43'21"N 65°30'28"W; NDFRC].

**NL: T = 18** (9♂, 9♀). **FIRST RECORD:** 1♀, Doyles, Codroy Valley, 9.vii.1959 (D.C. Ferguson) / (*Chrysopa oculata* Say, Det. P. Adams) [USNM]. **FLIGHT PERIOD:** June 11 (1979; Bishop's Falls)–August 14 (1977; Tompkins). **LOCALITIES:** Bishops Falls [Bishop's Falls, 49°01'N 55°29'W; SJARS]. Codroy Pond [48°04'N 58°52'W; USNM]. Co[r]ner Brook [48°58'N 57°57'W; MU, NDFRC]. Cow Head [49°55'N 57°49'W; ZMUH]. Doyles, Codroy Valley [47°50'N 59°11'W; USNM]. Gros Morne P[ar]k, n[ea]r Interpretive Centre [Gros Morne National Park of Canada, 49°41'22"N 57°44'20"W; MU]. H[igh]w[a]y 430, junction with Upper Humber River [Upper Humber River, 49°10'35"N 57°27'57"W; MU]. North Branch [47°54'55"N 59°02'20"W; USNM]. Terra Nova N[a]t[ional] P[ar]k, Salton B[roo]k [Saltons Brook, 48°35'N 53°57'W; MU]. Tompkins [47°48'N 59°13'W; SJARS]. S[ain]t Georges [Saint George's, 48°26'N 58°29'W; SJARS].

**NS: T = 85** (41♂, 34♀, 10?). **FIRST RECORD:** 1?, Truro, 1.vii.1913 (R. Matheson) [CU<sup>78</sup>]. **NEW RECORDS:** 1♀, C[ape] B[reton] Highlands N[at]ional P[ar]k, Lone Shieling, PG732858, 14.viii.1983 (J.E.H. & R.J. Martin) [CNC]. 1♂, C[ape] B[reton] H[ighlands] N[at]ional P[ar]k, Mackenzie M[oun]t[ain], 300 m, PG645851, 22.vi.1983 [J.R. Vockeroth] / (dry roadside with *Fragaria*, J.R. Vockeroth) [CNC]. 1♂, S[outh] Harbour B[ea]ch, PG962943, 29.vi.1983 (J.R. Vockeroth) / (mixed dry mesophytic woods, J.R. Vockeroth) [CNC]. **FLIGHT PERIOD:** May 30 (1979; Bridgewater)–September 19 (1977; Centreville, Shelburne County). **LOCALITIES:** Armdale [44°38'N 63°38'W; NSM, USNM]. Argyle, Yarmouth Co[unty] [43°56'N 65°46'W; USNM]. Aylesford, Kings Co[unty] [45°02'N 64°50'W; NSM]. Baddeck [46°06'N 60°45'W; CNC]. Boulderwood, Halifax [44°37'N 63°35'W; USNM]. Bridgewater, Lunenburg Co[unty] [44°23'N 64°31'W; NSM]. C[ape] B[reton] H[ighlands] N[at]ional P[ar]k, Lone Shieling, PG732858 / C[ape] B[reton] H[ighlands] N[at]ional P[ar]k, Mackenzie M[oun]t[ain], 300 m, PG645851 [Cape Breton Highlands National Park of Canada, 46°44'30"N 60°38'30"W; CNC]. Centreville, Shelburne Co[unty] [43°29'N 65°36'W; NSM]. Chester [44°33'N 64°15'W; NSM]. Cheticamp, C[ape] B[reton] I[sland] [Chéticamp, 46°38'N 61°01'W; CNC]. Dean [45°12'N 62°53'W; CNC]. Durham [45°37'N 62°49'W; LEM]. Economy P[oin]t, Colchester Co[unty] [45°23'N 63°54'W; USNM]. Fairmont R[oa]d, Antigo[nish] Co[unty] [Fairmont, 45°42'N 61°59'W; NSM]. Gaspero R[oa]d, Kings Co[unty] [Gaspereau, 45°04'N 64°21'W; NSM]. Halifax [44°52'N 63°43'W; NSM]. Isle Haute, Bay of Fundy [Haute, Isle, 45°15'N 65°00'W; USNM]. Kentville [45°05'N 64°30'W; CNC<sup>79</sup>, LEM]. Kings Co[unty] [45°02'N 64°40'W; NSM]. Kings Co[unty], n[ea]r Aylesford [Aylesford, 45°02'N 64°50'W; USNM]. Lake Kejimikujik, Queen's Co[unty] [Kejimikujik Lake, 44°23'N 65°15'W; USNM]. Liverpool [44°02'N 64°43'W; CNC]. Lockeport [43°42'N 65°07'W; CNC]. Pictou [45°41'N 62°43'W; ROM]. Portapique [45°24'N 63°42'W; LEM]. Porter's P[oin]t, Kings Co[unty] [Porter Point, 45°09'N 64°23'W; NSM]. Sable Island<sup>80</sup>, Met[eorological] Station [43°57'N 59°55'W; NSM]. S[outh] Harbour B[ea]ch, PG962943 [46°53'N 60°26'W; CNC]. S[outh] Ohio, Yarmouth Co[unty] [South Ohio, 43°55'N 66°04'W; LEM]. Springhill [45°39'N 64°03'W; LEM]. Truro [45°22'N 63°16'W; CU]. Wh[ite] R[oc]k, Kings Co[unty] [45°03'N 64°25'W; NSM]. Willowdale [45°24'N 62°13'W; CNC]. Wolfville [45°05'N 64°22'W; KARS, LEM]. Woodville [Woodville, Kings County, 45°05'52"N 64°39'06"W; LEM]. Wundham [Windham Hill, 45°37'N 64°00'W; LEM].

**NT: T = 14** (8♂, 5♀, 1?). **FIRST RECORD:** 1♀, Fort Smith, 16.vi.1950 (J.B. Wallis) / (*Chrysopa oculata* Say, Det. P. Adams) [CNC]. **NEW RECORDS:** 1♂, Norman Wells, 24.vi.1969 (G.E. Shewell) [CNC]. **FLIGHT**

77. Garland 1982 [1984]: 356, line 14: Kouchibougouac, should read: Kouchibouguac; label is correct.

78. Label data without gender provided by L.L. Pechuman *in litt.* 1980.

79. Includes Paratype of *Chrysopa oculata* var *carei* Smith.

80. Sable Island is an isolated, treeless, twenty mile strip of sand over 100 miles SE of Cape Canso, covered only with coarse grasses, Juniper, Beach Pea and other seashore plants (Ferguson 1954); more precisely, it is located 150 miles [240 km] east of NS in the Atlantic Ocean (Howden 1970).



**PERIOD:** June 16 (1950; Fort Smith)–August 19 (1950; Fort Simpson). **LOCALITIES:** Fort Simpson [61°51'45"N 121°20'55"W; CNC]. Fort Smith [60°00'N 111°53'W; CNC]. Norman Wells [65°16'55"N 126°49'45"W; CNC].

**ON: T = 615** (216♂, 364♀, 35?) + 1 larva. **FIRST RECORD:** 1♂, Trenton, at light, 1.vi.1901 (Evans<sup>81</sup>) / (*Chrysopa oculata* Say, Det. P. Adams) [ROM]. **NEW RECORDS:** 1♀, St. David, 21.viii.1930 (W.E. Steenburg) / [hand-written] (18064C30-15a, 21.viii.[19]30) / (*Chrysopa oculata chlorophana* (Burm.), Det. G.S. Walley, [19]30) [CNC]. 1♀, St. David, 21.viii.1930 (W.E. Steenburg) / [hand-written] (18064C30-15a, 21.viii.[19]30) / (*Chrysopa oculata* Say, Det. G.S. Walley, [19]30) [CNC]. 1♀, St. Davids / [hand-written] (18064C30-15a, 21.viii.[19]30) / (*Chrysopa oculata* Say, Det. G.S. Walley, [19]30) [collector unknown; CNC]. 1♂, Belleville, in light trap, 26.vi.[19]34 [collector unknown; CNC]. 1♀, P.F.E.S.<sup>82</sup>, 19/7/48 [19.vii.1948] (J.A. Ham<sup>83</sup>) / [type-written] (3–52) / [type-written] (U.N.B.52) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / [hand-written] (2226) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♂, Puslinch T[o]w[n]s[h]ip, Con[cession] R[oad] 2, 23.ix.[19]60 (E. Bond) [CNC]. 1♂, Prescott, 19.vi.1963 (J.R. Vockeroth) [CNC]. 1♀, Ancaster, 21.viii.1965 (J.E.H. Martin) [CNC]. 1♀, Ottawa, 10.ix.1973 (Coll. E. Mann) [CNC]. 1♂, S[ain]t Lawrence Is[lands] Nat[ional] Park, Mermaid Island / Code 4186-Z, 23.vii.1976 (Reid) [CNC]. 1♂, S[ain]t Lawrence Is[lands] Nat[ional] Park, McDonald Is[land] / Code 4763-O, 18.ix.1976 (Calderwood) [CNC]. 1♀, Elmira, Salem Creek, F[ilet] F[au]cheur<sup>84</sup>, 26.v.[19]77 (L. LeSage) [CNC]. 1♀, Rideau Ferry, Big Rideau Lake, 26.viii.[19]85 (S. Peck), [hand-written, underside of label] (forest-field ev. car netting) [CNC]. 3♂, 3♀, Chaffey's Locks, QUBS, 1-5.9.85 [1-5.ix.1985] (S. Peck), [hand-written, underside of label] (field-forest ev. car netting) [CNC]. **FLIGHT PERIOD:** May 6 (1978; Arkell)–October 30 (1956; Tews Falls). **LOCALITIES:** Aberfoyle [43°28'N 80°09'W; UG]. Agincourt [43°17'N 79°17'W; UG]. Algonquin P[ar]k [45°33'N 78°35'W; CNC]. Ancaster [43°13'N 79°59'W; CNC, MCMU, UG]. Appin [42°48'N 81°39'W; CNC]. Apple Hill [45°13'N 74°46'W; LEM]. Arkell [43°32'N 80°10'W; UG]. Aylmer [42°46'N 80°59'W; MCMU]. Bala [45°01'N 79°37'W; CNC]. Bancroft [45°02'N 77°45'W; CNC, ROM]. Batchawana Bay, L[ake] Superior [Algoma District, 46°56'N 84°36'W; ROM]. Baxter [44°15'N 79°50'W; UG]. Beachburg [45°44'N 76°51'W; ROM]. Belleville [44°14'N 77°21'W; CNC, LEM, RARS, ROM]. Bell's Corners [Bells Corners, 45°19'N 75°50'W; CNC]. Belwood [43°47'N 80°19'W; UG]. Bertram T[ownshi]p, French R[iver] [Nipissing District, 46°12'N 79°59'W; ROM]. Blackburn [45°26'N 75°33'W; UG]. Black Lake, N[orth] Burgess T[ownshi]p [Black Lake, Lanark County, 44°46'N 76°18'W; LEM<sup>85</sup>]. Black Rapids, Rideau R[iver] [Carleton County, 45°19'N 75°42'W; CNC]. Black Sturg[eon] Lake<sup>86</sup> [49°20'N 88°53'W; ZMUH]. Blenheim [42°20'N 82°00'W; UG]. Bradford [44°07'N 79°34'W; UG]. Brantford [MCMU]. Brighton [44°06'N 77°46'W; CNC]. Brooklin [43°57'N 78°57'W; UG]. Bruce Co[unty], N Boat L[ake] [Boat Lake, 44°44'N 81°14'W; ROM]. Bruce Co[unty], 3.5 km E [of] Sauble Falls Prov[incial] P[ar]k [Sauble Falls Provincial Park, 44°40'15"N 81°15'30"W; ROM]. Byron Bog, London [London, 42°59'N 81°14'W; MCMU]. Caistor Center [Caistor Centre, 43°04'N 79°39'W; UG]. Calabogie [45°18'N 76°43'W; ROM]. Cambridge [43°23'N 80°19'W; UG]. Cawaja Beach, Tiny T[ownshi]p, Simcoe Co[unty] [44°42'N 80°01'W; ROM]. Cayuga [42°56'N 79°51'W; UG]. Cedar Lake, 20 mi[les] S / Cedar Lake, F[ie]ld Sta[tion], Vermillion [sic] Bay [Cedar Lake, Algonquin Park, 46°01'N 78°28'W; CNC, UG]. Chaffey's Locks [44°35'N 76°19'W; CNC, ROM]. Chalk River [46°01'N 77°27'W; LEM]. Chatham [42°24'N 82°11'W; CNC, UG, UWO]. Chatterton [44°15'N 77°29'W; CNC, UG]. Clinton [43°37'N 81°32'W; UG]. Cochrane [49°09'N

81. J.D. Evans, an early collector in Ontario (Riotte 1992: 6).

82. Petawawa Forest Experiment Station, 1918–1979; subsequently the Petawawa National Forestry Institute, 1979–1996, and the Petawawa Research Forest, 1996–present (Place 2002).

83. J.A. Ham, a student at the University of New Brunswick (Forestry), originated from Ottawa and graduated from U.N.B. in 1949 (Bryant 1958: 113).

84. Filet faucheur = sweep net.

85. Record based on a single third-instar larva, discussed and figured by Downes (1974: 122); the larva was found in July 1971 at Black Lake, Stanleyville, Ontario (Downes 1974).

86. Black Sturgeon Lake, Thunder Bay District: Rockburne and Lafontaine 1976: 9.

81°02'W; UG]. Coldstream [43°01'N 81°30'W; CNC]. Constance Bay [45°30'N 76°05'W; CNC]. Cooksville [43°34'N 79°37'W; ROM]. Cornwall [45°02'N 74°44'W; CNC]. Credit Forks [Forks of the Credit Provincial Park, 43°49'N 80°00'30"W; ROM]. Cumberland [45°31'N 75°24'W; UG]. Dalrymple [44°38'N 79°06'W; UG]. De Grassi P[oin]t [44°15'N 79°32'W; ROM]. Dover T[ownshi]p [42°26'N 82°24'W; CNC]. Dryden [49°47'N 92°45'W; CNC]. Dundas [43°16'N 79°58'W; UG]. Dunnville [42°54'N 79°37'W; ROM]. Dyers Bay [Dyer's Bay, 45°09'47"N 81°20'21"W; UG]. Elmira / Elmira, Salem Creek [Elmira, 43°36'N 80°33'W; CNC, UG]. Elora [43°41'N 80°26'W; UG]. Elphin, 2 mi[les] W, Frontenac Co[unty] [44°55'N 76°37'W; ROM]. F[or]t William, M[oun]t McKay, 1000 ft [305 m] [Mount McKay, 48°21'N 89°17'W; CNC]. Fisher Glen [45°21'02"N 75°42'40"W; CNC]. Galt [43°22'N 80°19'W; MCMU]. Gananoque / Gananoque, 2 mi[les] W [44°20'N 76°10'W; LEM, UG]. Garvel River [Gravel River, 48°55'N 87°46'W; ZMUH]. Georgian Bay Island 421 [Georgian Bay Islands National Park of Canada, 44°53'N 79°52'W; UG]. Go Home Bay [44°59'N 79°56'W; CNC]. Gold Lake [conflicting place names; UG]. Golden Lake [45°35'N 77°14'W; LEM]. Grassie [43°09'N 79°37'W; UG]. Grav[en]h[ur]st [44°55'N 79°22'W; UG]. Grimsby [43°12'N 79°34'W; CNC, UG]. Guelph [43°33'N 80°15'W; LEM, UG]. Hamilton [43°14'N 79°57'W; MCMU, UG]. Harrow [42°02'N 82°55'W; CNC, UG]. Hastings [44°18'N 77°57'W; UG]. Havlock [Havelock, 44°26'N 77°53'W; UG]. Hawkesbury [45°36'N 74°37'W; LEM]. Hepworth [44°37'N 81°09'W; UG]. Hespeler [43°26'N 80°19'W; UG]. Highland P[ar]k [45°22'58"N 75°45'30"W; ROM]. Iron Bridge [46°17'N 83°14'W; CNC]. Jordan [43°09'N 79°23'W; CNC]. Kearney [45°33'N 79°13'W; CNC]. Kendal / Kendal, Squires temporary pond #1 [44°02'N 78°32'W; ROM]. Keswick [44°15'N 79°28'W; UG]. Killarney Prov[incial] P[ar]k [46°05'N 81°23'W; UG]. Kingsville [42°06'N 82°44'W; CNC, ROM]. Lake Nipissing / Lake Nipissing, 52<sup>nd</sup> Creek [46°17'N 80°00'W; ROM]. L[ake] Opeongo, Algonquin P[ar]k [45°42'N 78°23'W; MCMU]. Lavant Station, Lanark Co[unty] [45°03'N 76°42'W; ROM]. Leamington [42°05'N 82°34'W; CNC]. Leaside [43°42'N 79°22'W; ROM]. Limogies, Russell Co[unty] [Limoges, 45°20'N 75°15'W; ROM]. London, 22 mi[les] E [Thamesford, 43°04'N 81°00'W; LEM]. Lyn<sup>87</sup>, Sewage Pit [44°35'N 75°47'W; CNC, ROM]. Maberly [44°50'N 76°32'W; LEM]. Mallorytown [44°29'N 75°53'W; ROM]. Marmora [44°29'N 77°41'W; CNC]. Merivale [45°19'N 75°43'W; CNC, UG]. Mer Bleue<sup>88</sup> [45°24'N 75°30'W; CNC]. Midland [44°45'N 79°53'W; UG]. Miller Lake [45°06'N 81°26'W; UG]. Mississauga [43°35'N 79°39'W; ROM]. Morpeth [42°23'N 81°51'W; UG]. Nepean T[ownshi]p [45°16'N 75°46'W; CNC]. New Market [44°03'N 79°28'W; UG]. Niag[ara] Falls [43°06'N 79°04'W; UG]. Nichol T[ownshi]p [43°42'N 80°23'W; UG]. Nipigon [49°01'N 88°16'W; LEM]. Noelville [Noëlville, 46°08'00"N 80°25'56"W; UG]. Nogies Cr[ee]k Res[ear]ch St[atio]n, 6 mi[les] NE [of] Bobcaygeon [Nogies Creek, 44°35'N 78°30'W; ROM]. North Gower [45°08'N 75°43'W; CNC]. Norval [43°39'N 79°51'W; UG]. Norway P[oin]t, L[ake] of Bays [45°13'N 79°01'W; ROM]. One Sided Lake [Claxton Township, Rainy River District<sup>89</sup>, 49°03'N 93°54'W; CNC]. Ormand Beach [Ormond Beach, 42°39'N 81°02'W; UWO]. Orono [43°59'N 78°37'W; UG]. Orwell [42°46'N 81°02'W; UG]. Ottawa [45°16'N 75°45'W; CNC, UG]. Parry Sound [45°21'N 80°02'W; CNC]. Pelee Is[land] [41°45'N 82°41'W; ROM]. P[etawawa] F[orest] Experiment S[tation] [Chalk River<sup>90</sup>, 46°01'N 77°27'W; CNC]. Peterborough [44°18'N 78°19'W; UG]. Pickering / Pickering, conc[ession] #5 E of sideroad 10 & 11 [43°54'N 79°08'W; ROM, UG]. Pinery Prov[incial] P[ar]k, Lambton Co[unty] / Pinery Prov[incial] P[ar]k, Burley Campground / Pinery Prov[incial] P[ar]k, Ausable R[iver] n[ear] Riverside Campground / Pinery Prov[incial] P[ar]k, Riverside Campground / Pinery Prov[incial] P[ar]k, Nat[ure] Display Cent[re] [The Pinery Provincial Park, 43°15'15"N 81°50'00"W; ROM, WLUM]. Point Pelee [Point Pelee National Park of Canada, 49°58'N 82°31'W; CNC, ROM, UG]. Port Arthur [Thunder Bay, 48°24'N 89°19'W; UG]. Port Colborne [42°54'N

87. Police Village. Gazetteer of Canada (Ontario). Energy, Mines and Resources Canada. 1988, 4<sup>th</sup> Ed.

88. Bog. Gazetteer of Canada (Ontario). Energy, Mines and Resources Canada. 1988, 4<sup>th</sup> Ed.

89. J.E.H. Martin, personal communication [1980].

90. Petawawa Forest Experiment Station (now Petawawa Research Forest), located in the northern 100 km<sup>2</sup> of the Petawawa Military Reserve near Chalk River ON; Headquarters on the shore of Corry Lake, about 3–4 miles from Chalk River (Place 2002: 5).

79°14'W; UG]. Port Credit [43°33'N 79°35'W; ROM]. Port Elgin [44°26'N 81°24'W; UWO]. Port Hope [44°01'N 78°24'W; UG]. Powassan [46°02'N 79°21'W; UG]. Prescott [44°43'N 75°31'W; CNC]. Preston [43°23'N 80°21'W; UG]. Primrose [44°06'N 80°08'W; UG]. Puslinch T[ownship], Con[cession] R[oad] 2 [Puslinch Township, 43°28'N 80°10'W; CNC]. Rainy River [48°43'N 94°34'W; CNC]. Renfrew Co[unty] at junction of Ottawa and Madawaska Rivers, Arnprior [Arnprior, 45°26'N 76°21'W; ROM]. Rideau Ferry, Big Rideau Lake [Rideau Ferry, 44°51'N 76°09'W; CNC]. Rondeau Prov[incial] P[ark], Kent Co[unty] / Rondeau Prov[incial] P[ark], Kent Co[unty], n[ear] Dillon and Harrison Trails [42°17'N 81°52'W; ROM]. S[ain]t Catharines<sup>91</sup> [43°10'N 79°15'W; CNC]. S[ain]t David / S[ain]t Davids [Saint Davids, 43°10'N 79°07'W; CNC, UG]. S[ain]t Lawrence Is[lands] Nat[ional] Park, McDonald Is[land], Code 4763-O [McDonald Island, 44°19'N 76°10'W; CNC]. S[ain]t Lawrence Is[lands] Nat[ional] Park, Mermaid Island, Code 4186-Z [Mermaid Island, 44°18'N 76°11'W; CNC]. S[ain]t Thomas [42°47'N 81°12'W; CNC]. Sand Lake [conflicting place names; CNC]. S[ault] S[ainte] Marie [46°31'N 84°20'W; CNC, LEM]. Severn Bridge [44°46'N 79°20'W; ROM]. Shirley's Bay [Shirleys Bay, 45°22'N 75°53'W; CNC]. Silver Lake [Frontenac/Lanark, 44°50'N 76°36'W; LEM]. Singhampton [44°21'N 80°15'W; ROM]. Smithville [43°06'N 79°33'W; UG]. Smoke Lake, Algonquin P[ark] [45°31'N 78°41'W; ROM]. Smoky Falls, Mattagami R[iver] / Smoky Falls, Kapuskasing [50°04'N 82°10'W; CNC, ROM]. S[outh] Neebing T[ownship] [Neebing, 48°10'N 89°25'W; ROM]. Spanish [46°12'N 82°21'W; UG]. Spencerville<sup>92</sup> [44°51'N 75°33'W; CNC]. Stirling [44°18'N 77°33'W; UG]. Stoney Creek [43°13'N 79°46'W; UG]. Strathroy [42°57'N 81°38'W; CNC<sup>93</sup>]. Sudbury [46°31'N 80°54'W; ROM, UG]. Tews Falls [43°17'N 79°59'W; MCMU]. Thedford [43°09'N 81°51'W; UG]. Thessalon, Algoma District [46°15'N 83°34'W; LEM]. Thunder Bay [48°24'N 89°19'W; UG]. Thunder Bay District, 7.2 mi[les] S [of] Beardmore on R[oute] 11 [Beardmore, 49°36'N 87°57'W; ROM]. Toronto / Toronto, S end of Church S[treet] [43°42'N 79°25'W; ROM, UG]. Trenton [44°06'N 77°35'W; ROM]. Vineland [43°09'N 79°24'W; UG]. Wagerville [Wagarville, 44°38'N 76°48'W; CU]. Waterford [42°56'N 80°17'W; CNC]. Waterloo [43°28'N 80°31'W; WLUM]. Westport [44°41'N 76°24'W; ROM]. Wilkesport [42°44'N 82°22'W; UG]. Windsor [42°18'N 83°01'W; UG]. Zion [Thorndale<sup>94</sup>, 43°06'N 81°08'W; UWO].

**PE: T = 21** (8♂, 13♀). **FIRST RECORD:** 1♂, Dalvay House, Can. Nat. Park, 19.vii.1940 (G.S. Walley) / (*Chrysopa oculata* Say, Det. P. Adams) [CNC]. **NEW RECORDS:** 1♂, Brackley Beach, Rustico, 23.vii.1967 (J.E.H. Martin) [CNC]. **FLIGHT PERIOD:** June 23 (1978; Charlottetown)–August 9 (1956; York). **LOCALITIES:** Brackley Beach, Can[adian] Nat[ional] Park / Brackley Beach, Rustico [Brackley Beach, 46°25'N 63°11'W; CNC]. Charlottetown [46°14'25"N 63°08'05"W; CARS, LEM]. Dalvay House, Can[adian] Nat[ional] Park [Dalvay-by-the-Sea Hotel National Historic Site, 46°24'54"N 63°04'15"W; CNC]. Green Gables, Cavendish Beach [Green Gables, 46°29'N 63°23'W; CNC]. Hunter River [46°21'N 63°21'W; CNC]. Stanhope [46°25'N 63°06'W; CNC]. York [46°19'N 63°06'W; CARS].

**QC: T = 479** (194♂, 253♀, 32?). **FIRST RECORD:** 1? [abdomen missing], Montreal, 11.vi.1901 (A.F. Winn) [LEM]. **NEW RECORDS:** 1♂, Laval, 5.6.84 [5.vi.[19]84] (A.C. Sheppard) [CNC]. 1♂, 1♀, Laval, 8.vi.[19]84 (A.C. Sheppard) [CNC]. 1♀, Laval, 31.viii.[19]84 (A.C. Sheppard) [CNC]. **FLIGHT PERIOD:** May 14 (1977; Sainte-Anne-de-Bellevue)–October 19 (1963; L'Île-Perrot). **LOCALITIES:** (unspecified locality) [UL Provancher Collection 1 and 2]. Anc[ienne] Lorette [Lorette, 46°47'24"N 71°21'24"W; UL]. Anticosti, Havre du Brick [Havre-du-Brick, 49°51'10"N 63°38'25"W; UL]. S[aint] L[ouis] Blandford, Arthabaska [Saint-Louis-de-Blandford, 46°15'N 72°00'W; CSQ]. Avoca [45°43'N 74°42'W; LEM]. Aylmer [45°23'42"N 75°49'56"W; CNC]. Baie Comeau [49°13'N 68°09'W; CNC]. Beauharnois [45°19'N 73°52'W; LEM]. Beech Grove [45°33'N 76°10'W; CNC, UAE]. Berthier [46°05'18"N 73°12'44"W; CNC, UdeM]. Berthierville [46°05'N 73°11'W; CNC, CRFL, CSQ, UdeM]. Brossard [45°27'N 73°28'W; UdeM]. Cap Rouge [Cap-

91. Garland 1982 [1984]: 347, line 5: St Catherines, should read: St Catharines; label is correct.

92. Garland 1982 [1984]: 347, line 21: Spenceville, should read: Spencerville; label is correct.

93. Includes Paratype of *Chrysopa oculata* var *carei* Smith.

94. Zion, where W.C. McGuffin lived at an early age, is near Thorndale (K. Bolte pers. comm.).



Rouge, 46°45'05"N 71°20'40"W; CNC]. Chambly Canton [45°26'51"N 73°17'24"W; LEM]. Chelsea [45°30'N 75°47'W; CNC, CU]. Clova [48°07'N 75°22'W; CNC]. Covey Hill [45°01'06"N 73°45'20"W; CNC]. Duchesnay [Duchesnay, Barrage de, 46°52'02"N 71°38'15"W; CSQ]. Gaspé [48°50'N 64°29'W; CNC]. Godbout [49°19'N 67°36'W; ROM]. Gracefield [46°06'N 76°03'W; CNC]. Hauterive, Rivière à la Chasse [Hauterive, Poste de, 49°11'21"N 68°23'12"W; UdeM]. Hemmingford [45°03'N 73°35'W; CNC, UQC]. Hudson H[eigh]ts [45°27'51"N 74°09'05"W; LEM, ZMUH]. Hull [Gatineau, 45°29'N 75°39'W; CNC]. Ile Jésus [Île-Jésus, Laval, 45°35'N 73°45'W; UdeM]. Ile Perrot [L'Île-Perrot, 45°23'N 73°57'W; LEM]. Kazabazua [45°57'N 76°01'W; CNC]. Kirks Ferry [Kirk's Ferry, 45°32'30"N 75°49'00"W; CNC]. Knowlton [45°13'02"N 72°31'01"W; CNC, ROM]. Lac Cameron, Labelle Co[unty], 1 km N [Lac-Cameron, Amherst, 46°07'15"N 74°50'06"W; LEM]. Lac Carre, Terrebonne Co[unty], Lot 31, Range 8 [Lac-Carré, 46°08'N 74°29'W; LEM]. Lac Mercier [conflicting place names; CNC]. Lac Mondor, S[ain]te Flore [Lac-Mondor, Sainte-Flore, 46°37'32"N 72°45'52"W; CNC]. Lac S[ain]t Louis, Station 7 [Lac-Saint-Louis, 46°33'40"N 73°48'20"W; UdeM]. Lac Serpent [Lac-Serpent, Notre-Dame-de-Laus, 46°09'N 75°30'W; LEM]. Laniel [47°03'N 79°16'W; LEM]. Lanoraie [45°58'N 73°13'W; CNC, LEM]. La Trappe [45°29'41"N 74°01'30"W; UdeM]. Laval [45°35'N 73°45'W; CNC, LEM]. Louiseville [46°15'N 72°57'W; UdeM]. Magog [45°16'N 72°09'W; LEM]. Matapedia, 3.2 mi[les] E [47°58'N 66°57'W; CNC]. Mistassini [50°19'N 74°01'W; UdeM]. Mont Albert, base [Mont-Albert, La Haute-Gaspésie, 48°55'N 66°11'W; LEM]. Montcalm Co[unty] [Montcalm, Canton de, Les Laurentides, 46°00'N 74°30'W; LEM]. Montreal [Montréal, 45°31'N 73°39'W; CSQ, CU, LCCU, LEM, UdeM, USNM]. Monts [conflicting place names; CNC]. Mont S[ain]t Hilaire [Saint-Hilaire, 45°33'30"N 73°11'54"W; LEM]. Nominigüe [46°24'N 75°02'W; UdeM]. Oka [45°28'N 74°05'W; CSQ]. O[ttawa] Golf Club [Gatineau, 45°50'N 76°05'W; CNC]. Parc du Mont Tremblant [Mont-Tremblant, Parc national du, 46°26'N 74°21'W; UdeM]. Perkins [45°36'01"N 75°37'01"W; UG]. Piopolis, Frontenac [45°29'N 70°54'W; UL]. Pointe Claire [Pointe-Claire, 45°26'55"N 73°49'03"W; LEM]. Pointe des Cascades [Pointe-des-Cascades, 45°20'N 73°58'W; LEM]. Queens Park, Aylmer / Queen's Park, Aylmer [Queens Park, 45°24'36"N 75°53'21"W; CNC]. Rawdon [46°03'N 73°43'W; LEM]. Rigaud [45°29'N 74°18'W; LEM, UdeM]. Rougemont, Orchard 750 [45°26'N 73°03'W; CNC]. S[ain]t Aubert, L'Islet [Saint-Aubert, 47°11'N 70°13'W; CRFL]. S[ain]t Barthelemy [Saint-Barthélemy, 46°11'N 73°08'W; UdeM]. S[ain]te Anne de Bellevue [Sainte-Anne-de-Bellevue, 45°24'N 73°56'W; LEM]. S[ain]te-Catherine, Port[neuf] [Sainte-Catherine-de-la-Jacques-Cartier, 46°51'N 71°37'W; CNC]. S[ain]te Clotilde [Sainte-Clotilde-de-Châteauguay, 45°09'29"N 73°40'42"W; SJRS]. S[ain]te Foy [Sainte-Foy-Sillery, 46°46'15"N 71°17'00"W; CRFL, CSQ, UL]. S[ain]t Eugène [Saint-Eugène, Drummond, 45°48'N 72°42'W; UdeM]. S[ain]t Henri, Lévis [Saint-Henri, Bellechasse, 46°42'N 71°04'W; CRFL]. S[ain]t Hilaire [Mont-Saint-Hilaire, 45°34'N 73°12'W; CU]. S[ain]t Martin, C[om]té Beauce [Saint-Martin, Beauce-Sartigan, 45°58'N 70°39'W; CSQ]. S[ain]t Martin J[unctio]n [unknown locality; LEM]. S[ain]t Martin de Laval [Saint-Martin, Laval, 45°35'15"N 73°43'32"W; CSQ]. S[ain]t Pie<sup>95</sup>, Bagot [45°30'N 72°54'W; UQC]. S[ain]t Thomas de Joliette [Saint-Thomas-de-Joliette, 46°00'56"N 73°21'01"W; CSQ]. Seven Isl[and]s [Sept-Îles, 50°12'N 66°23'W; CNC]. Shawbridge [45°52'17"N 74°04'45"W; LEM]. Shawinigan Falls, 4 mi[les] S [Shawinigan, Chutes de, 46°31'58"N 72°46'28"W; LEM]. Tadoussac [48°09'N 69°43'W; LEM]. Vaudreuil [Vaudreuil-Dorion, 45°24'N 74°02'W; LEM].

**SK: T = 190** (92♂, 92♀, 6?). **FIRST RECORD:** 1♂, Oxbow, 15.vi.1907 (Fredk. Knab) [USNM]. **NEW RECORDS:** 1♂, 1♀, Creelman, (F.I.S., Inc[losure] 2060-01, Rec[eived] 17-7-[19]67) [collector unknown] / (*Caragana*, W67-2060-01) [NFRC]. 1♀, Carrot River, ([F.I.S.], Inc[losure] W67-2649, Rec[eived] 28-7-[1967]) [collector unknown] / (*Caragana*, W67-2649) [NFRC]. 1♀, Fiske, (F.I.S., Inc[losure] 1110, Em[erged] 22-6-[19]67) [collector unknown] / (*Acer negundo*, R[ea]r[e]d, W67-1110) [NFRC]. 2♀, Goodeve,

95. Provancher (1871a: 142), wrote: "Un correspondant de St. Pie, ... dans le *Journal d'Agriculture* de St. Hyacinthe, ... mentionne l'*Hémérobe perle*, mais cet insecte ne se trouve pas en Canada, pas même en Amérique, pensons-nous." Garland (1982 [1984]: 176) cited this as St. Hyacinthe, in error.

(F.I.S., Inc[losure] 1280, Rec[eived] 26-6-[19]67) [collector unknown] / (*Caragana*, W67-1280) [NFRC]. 1♂, Indian Head, 28.vi.1952 [collector unknown] / (from *Acyrtosiphon caraganae* Chlodkovsky, *Caragana arborescens*) / (*Chrysopa oculata* var. *chlorophanta* [sic] Burm.) [NFRC]. 1♂, 1♀, Indian Head, 28.vi.1952 [collector unknown] / (from *Ayrthosiphon* [sic] *caraganae* Chlodkovsky, *Caragana arborescens*) [NFRC]. 1♂, Indian Head, Nursery, (F.I.S., Inc[losure] 770-02, Em[erged] 15-6-[19]67) [collector unknown] / (*Salix* sp., R[ea]r[e]d, W67-770-02) [NFRC]. 1♂, Indian Head, PFRA [Prairie Farm Rehabilitation Act, Tree Nursery], coll[ected] on poplar stool foliage at sunset, 5.vii.1968 (J.A. Garland) [NFRC]. 1♀, Indian Head, Tree Nursery, 21.viii.1969 (J.A. Garland), [hand-written, underside of label] (F3, sunset, sweeping from *Caragana* row) [NFRC]. 1♂, 1♀, Prince Albert, 8.vii.1968 (J.A. Garland) / (collected at sunset on foliage of poplar stool) [NFRC]. 1♀, Saskatoon, L[ight], 9.vii.1923 (Kenneth M. King) / (*Meleoma* sp. near *emuncta*, Prob. new, Det. by R.C.S[mith]) [CNC<sup>96</sup>]. 1♂, Smitey [sic], ([F.I.S., Inc[losure] W69-1957, Em[erged] 24-6-[1969]) [collector unknown] / (*Chrysopa oculata* Say, J.E.M.) [NFRC]. 1♂, Uranium City, 21.vi.1962 (J.G. Chillcott) [CNC]. 1♂, Zealandia, (F.I.S., Inc[losure] 1109, Rec[eived] 22-6-[19]67) [collector unknown] / (*Acer negundo*, R[ea]r[e]d, W67-1109) [NFRC]. **FLIGHT PERIOD:** May 30 (1958; Kenosee / 1977; Indian Head)–September 3 (1928, 1936; Indian Head). **LOCALITIES:** Assiniboia [49°38'N 105°59'W; CNC]. Attons Lake, Cut Knife [Atton's Lake Regional Park, 52°50'00"N 108°51'45"W; CNC]. Avonlea [50°01'N 105°04'W; RARS, SMNH]. Bagley<sup>97</sup> [53°03'N 104°39'W; CNC]. Beaver Creek [51°58'N 106°40'W; CNC]. Big River [53°50'N 107°01'W; CNC, UG]. Blaine L[a]k[e] [52°50'N 106°54'W; RARS]. Broadview [50°22'N 102°35'W; CNC]. Burnham [50°15'N 107°28'W; RARS]. Carrot River [53°17'N 103°35'W; NFRC]. Christopher Lake [53°32'N 105°48'W; CNC]. Corinne [50°03'N 104°37'W; RARS]. Creelman [49°49'N 103°18'W; NFRC]. Cypress Hills [Cypress Hills, Mountain in SK, 49°40'N 109°30'W; SMNH]. Cypress Hills Prov[incial] P[ar]k [49°40'N 109°31'W; ROM]. Davin [50°23'N 104°07'W; RARS]. Delmas [52°56'N 108°36'W; BMNH]. Dilke [50°52'N 105°15'W; RARS]. Duck Lake [52°49'N 106°14'W; CNC]. Elbow [51°07'N 106°35'W; CNC]. Esterhazy [50°39'N 102°05'W; CNC]. Estevan [49°08'N 102°59'W; CNC, RARS]. Estuary [50°56'N 109°49'W; SMNH]. Fiske [51°29'N 108°24'W; NFRC]. Fort à la Corne [Fort-à-la-Corne<sup>98</sup>, 53°09'N 104°47'W; CNC]. Gainsborough [49°10'N 101°27'W; SMNH]. Glenewen [Glen Ewen, 49°12'N 102°01'W; SMNH]. Goodeve [51°04'N 103°11'W; NFRC]. Grey [Gray, 50°10'N 104°26'W; RARS]. Indian Head [50°32'N 103°40'W; CNC, IHTN, NFRC, RARS, UMW]. Jameson [50°24'N 104°17'W; RARS]. Jan Lake [54°54'N 102°49'W; SMNH]. Kenosee [Kenosee Lake, 49°50'N 102°17'W; CNC, USS]. Lebreton [50°45'N 103°42'W; CNC]. Liebenthal, 10 mi[les] S [50°40'N 109°32'W; ROM]. Lumsden [50°39'N 104°52'W; CNC]. Macdowal [Macdowall, 53°01'N 106°01'W; SMNH]. Macklin [52°20'N 109°56'W; USS]. Maple Creek, 1 mi[les] NW [49°55'N 109°29'W; ROM]. Melfort [52°52'N 104°37'W; RARS]. Moose M[oun]t[ain] Prov[incial] P[ar]k [49°48'30"N 102°25'00"W; ROM, SMNH]. Nipawin [53°22'N 104°00'W; UG]. Outlook [51°30'N 107°03'W; UG]. Oxbow [49°14'N 102°10'W; USNM]. Oyama [Oyama Regional Park, 50°18'30"N 104°12'45"W; RARS]. Pike L[ake] Prov[incial] P[ar]k, [near] Saskatoon [51°53'40"N 106°49'00"W; ROM, SMNH]. Prince Albert [53°12'N 105°46'W; CNC, NFRC]. Qu'Appelle Valley [RARS]. Regina [50°27'N 104°37'W; RARS, SEM, UMW]. Roche Percee [49°04'N 102°48'W; SMNH]. Rowatt [50°20'N 104°37'W; RARS]. S[ain]t Victor [49°26'N 105°52'W; CNC]. Saskatoon [52°07'N 106°38'W; CNC, USS]. Scout Lake [49°22'N 106°00'W; CNC]. Smitey [Smiley, 51°38'N 109°29'W; NFRC]. Snowdon [Snowden, 53°29'N 104°41'W; CNC]. Somme [52°35'N 102°58'W; CNC]. Stenen [51°54'N 102°23'W; RARS]. Tantallon [50°32'N 101°50'W; SMNH]. Uranium City [59°34'N 108°37'W; CNC]. Val Marie

96. Reported by Smith (1932: 599; as *Meleoma* species near *emuncta*). In the 1980's, the specimen could not be located (Garland 1985: 751); it has since been found and is here reported as one of a series of *C. oculata* collected in 1923 by Kenneth M. King at Saskatoon SK [CNC].

97. Bagley: ceased to exist, name has been rescinded; formerly SW of Nipawin. Gazetteer of Canada (Saskatchewan). Energy, Mines and Resources Canada. 1969, 2<sup>nd</sup> Ed.

98. Fort à la Corne: "The Hudson's Bay Company's Fort à la Corne stood on a fine river-flat on the Saskatchewan River, east of the Indian Reserve and north of Kinistino." (Morton 1937: 136); more recently, a Post Office SW of Nipawin. Gazetteer of Canada (Saskatchewan), 2<sup>nd</sup> Ed. 1969.

[49°14'N 107°44'W; CNC]. Wakaw [52°39'N 105°44'W; CNC]. Weyburn [49°40'N 103°51'W; LEM]. Whitefox [White Fox, 53°27'N 104°05'W; CNC]. Zealandia [51°37'N 107°45'W; NFRC].

**YK: T = 24** (12♂, 11♀, 1?). **FIRST RECORD:** 1♂, Whitehorse, 14.vi.1949 (J.K. Horie) / (*Chrysopa oculata* Say, Det. P. Adams) [CNC]. **NEW RECORDS:** 1♀, Dawson, 14 mi[les] E, 1300 ft [396 m], 30.vii.1962 (P.J. Skitsko) [CNC]. 1♀, Dawson, 14 mi[les] E, 1300 ft [396 m], 31.vii.1962 (P.J. Skitsko) [CNC]. **FLIGHT PERIOD:** June 10 (1980; Dawson)–July 31 (1962; Dawson, 14 miles E). **LOCALITIES:** Alaska H[igh]w[a]y [SEM]. Alaska H[igh]w[a]y, Horseshoe Bay, 1713 km, campground, 61°03'N 138°30'W [ROM]. Dawson [64°03'45"N 139°25'50"W; SEM]. Dawson, 14 mi[les] E, 1300 ft [396 m] [Dawson, 64°03'45"N 139°25'50"W; CNC]. Klondike H[igh]w[a]y, 466 km, Pelly X-ing [Pelly Crossing], campground, 62°49'N 136°35'W [ROM]. Klondike H[igh]w[a]y, pond at 476 km, Pelly X-ing [Pelly Crossing], 10 km N, 62°52'N 136°30'W [ROM]. Kluane N[atational] P[ark], Sheep M[oun]t[ain] [65°07'50 N, 140°31'30"W; SEM]. Kluane N[atational] P[ark], Slims R[iver] flats [60°59'45"N 138°32'00"W; SEM]. Mayo [63°35'35"N 135°53'45"W; ROM]. McCabe Cr[ee]k, 8 km S [62°32'10"N 136°46'00"W; SEM]. Pelly Crossing / Pelly X-ing [62°49'05"N 136°34'10"W; ROM, SEM]. Tatchun L[ake] [62°17'20"N 136°08'00"W; SEM]. Whitehorse [60°43'N 135°03'W; CNC, SEM].

#### UNITED STATES:

**AK: T = 4** (♀). **FIRST RECORD:** 1♀, Richard[son] H[igh]w[a]y, mile 315, 8.vi.1951 (J.R. McGillis) / (*Chrysopa oculata* Say, Det. P. Adams) [CNC]. **FLIGHT PERIOD:** June 8 (1951; Richardson Highway, mile 315)–June 26 (1979; Fairbanks, Malaise trap). **LOCALITIES:** Fairbanks [64°50'N 147°50'W; NSM]. Richard[son] H[igh]w[a]y, mile 315 [CNC].

*Chrysopa oculata* has been found in all provinces and territories of Canada except Nunavut; and in Alaska. Canadian localities in literature for which no specimen has been seen, are: BC: Okanagan Landing (Gibson 1914, as *Chrysopa assimilis*); NL: St. John's (Hagen 1861, as *Chrysopa transmarina*); NT: Fort Resolution<sup>99</sup> (Dutilly 1946, as *Chrysopoda [sic] oculata*); ON: Fonthill (Hagley 1979), London (Saunders 1875), St. Martin's Falls, Albany River [Martin Falls] (Walker 1853, as *Chrysopa latipennis* and *C. oculata*; cited by Hagen 1861, also cited by Throne 1971); QC: Compton (Gosse 1840 [1971])<sup>100</sup>, as *Hemerobius perla*, Lachine (Walker 1853, as *Chrysopa chlorophana*; Hagen 1861, as *Chrysopa transmarina*), and Sherbrooke (Banks 1903, as *Chrysopa chlorophana*). All specimens reported here are documented with data in Garland (1982, 2000), or as new records (above). *Chrysopa oculata* is multivoltine throughout its range in North America (Nechols *et al.* 1987). A study of geographic variability in physiological traits controlling dormancy in this species included study material from Grand Beach MB (Nechols *et al.*, *op. cit.*); voucher specimens are deposited in the personal collection of M.J. & C.A. Tauber<sup>101</sup>. Adults of *C. oculata* and other species in Canada emit an odour when disturbed (Provancher 1869), which is why Gosse's comments (1840 [1971]) were tentatively attributed to this species (Garland 1982 [1984]: 178). Based on label data, adults have been taken at light, in a car, on car netting, and in Malaise trap; trapped on sticky boards; and found on or around roadside plants, unshaded low plants, a clearing, woodland trees and shrubs, dry roadside with *Fragaria*, mixed dry mesophytic woods, a field, a crop field, a wet interdune meadow, a peat bog, a cat-tail swamp, a pond, along a forest access road, on plants in a bog, and at sunset on foliage of poplar stools in a tree nursery; adults also have been associated with, swept, hand-picked, beaten, or aspirated from *Acer negundo*, Alder, Alfalfa, *Artemisia absinthium*, Asparagus, Asters, *Caragana*, *Caragana arborescens*, *Chenopodium album*, *Cirsium arvense*, *Convolvulus*, *Convolvulus arvensis*, *Convolvulus sepium*<sup>102</sup>, Corn, *Crepis tectorum*, *Epilobium*, *Euphorbia esula*, Grass with Clover and Buttercups, Greasewood, *Kochia*, *Larix laricina*, Leafy Spurge,

99. Record in Dutilly (1946: 43) reads: Fort Resolution [61°10'N 113°40'W], June 29, 1940. No. 165550 Part, det. by H.K. Townes.

100. Gosse (1840 [1971]) applied the name *Hemerobius perla* to the "golden-eyed pearl fly ---frequent among the bushes" on his farm near Compton QC, and which emitted a "disgusting odour when handled."

101. C.A. Tauber, *in litt.* 2006.

102. = *Calystegia sepium* (Wiersema and León 1999).



*Melilotus officinalis*, Oak, Oats, 'orme' [Elm], Peach, *Picea glauca*, *Pinus contorta* var. *latifolia*, *Polygonum coccineum*, Poplar, Red Clover (cultivar Baker), Rose, *Rumex*, *Salix*, *Solidago*, *Sonchus arvensis*, *Taraxacum officinale*, *Tilia americana* (dead), Tobacco, T[rembling] Aspen, *Urtica gracilis*, *Thlaspi arvense*, Wheat, White Pine, and White Spruce. An adult is labelled as preying on *Ceratopogon* [Diptera]; others from *Acyrtosiphon caraganae* (Cholodkovsky) [Hemiptera]. Cocoons have been found in sandy soil. Bionomic notes on this species in literature pertaining to Canada have been summarised (Garland 1985a).

### **CHRYSOPE PLEURALIS Banks, 1911**

*Chrysopa pleuralis* Banks, 1911: 341–342. Co-types: one male, one sex unknown; USA: Colorado (North Boulder Creek, Boulder County; Steamboat Springs, Routt County); MCZ (Penny *et al.* 1997). No lectotype designated.

### SYNONYMY PERTAINING TO CANADA

*Chrysopa pleuralis*: Smith 1932: 591, 601; Spencer 1942: 27; Bickley and Macleod 1956: 192; Garland 1982 [1984]: 181–185, 360, Figs. 64–68, 73, Map 14; 1984: 93; 1985a: 737–751; Penny *et al.* 1997: 51; Garland 2000: 40.

**CANADA: T = 31** (6♂, 21♀, 4?). **FIRST RECORD:** BC: 1♀, Ainsworth, 11.vii.1903 (R.P. Currie) [USNM]. **FLIGHT PERIOD:** June 14 (1938; Clinton BC)–August 14 (1922; Banff AB).

**AB: T = 16** (3♂, 10♀, 3?). **FIRST RECORD:** 1♂, 2 ? [abdomen missing], Banff, 5.vii.1922<sup>103</sup> (C.B.D. Garrett) [CNC, USNM]. **NEW RECORDS:** 1♀, Fortress M[oun]t[ain], 51°55'N 145°10'W [*sic*], 1700–2000 m, *Equisetum*, 16.vii.[19]86 (H. Goulet) [pinned; originally in alcohol; CNC]. 1♂, 4♀, Fortress M[oun]t[ain], 51°55'N 145°10'W [*sic*], 1700–2000 m, *Equisetum*, 18.vii.[19]86 (H. Goulet) [pinned; originally in alcohol; CNC]. **FLIGHT PERIOD:** June 24 (1923; Waterton)–August 14 (1922; Banff, 6–7000 ft). **LOCALITIES:** Banff / Banff, 6–7000 ft [1830–2135 m] [Banff National Park of Canada, 51°36'N 116°03'W; CNC, USNM]. Fortress M[oun]t[ain], 51°55'N 145°10'W [*sic*], 1700–2000 m [Fortress Mountain<sup>104</sup>, 52°24'N 117°43'W; CNC]. Waterton [Waterton Lakes National Park of Canada, 49°05'N 113°52'W; CNC]. Waterton Lakes [49°03'N 113°54'W; CNC].

**BC: T = 15** (3♂, 11♀, 1?). **FIRST RECORD:** 1♀, Ainsworth, 11.vii.1903 (R.P. Currie) [USNM]. **FLIGHT PERIOD:** June 14 (1938; Clinton)–July 24 (1923; Hedley). **LOCALITIES:** Ainsworth [Ainsworth Hot Springs, 49°44'N 116°55'W; USNM]. Bootahnie Valley<sup>105</sup> [Bootahnie Indian Reserve 15, 40°24'N 121°32'W; ROM]. Clinton [51°05'N 121°35'W; CNC]. Hedley [49°21'N 120°04'W; CNC]. Lillooet [50°41'N 121°56'W; ROM]. Midday Val[ley], Merritt, 17153 Lot 24 [50°06'45"N 120°47'30"W; CNC]. Nicola [50°10'N 120°40'W; SEM]. Osoyoos, M[oun]t Kobau R[oa]d, km 17.1, 1720 m [Mount Kobau, 49°07'N 119°40'W; SEM].

*Chrysopa pleuralis* occurs in Canada, in the southern interior of British Columbia and in the Rocky Mountains of southwestern Alberta. All Canadian localities reported in literature have been authenticated. All specimens reported here are documented with data in Garland (1982, 2000), or as new records (above). Based on label data, adults have been found from 1720 m to 6–7000 ft [1830–2135 m] above sea level. The adult from Merritt BC was associated with *Pinus ponderosa*; those from Fortress Mountain AB, with *Equisetum*.

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103. An older, undated record is as follows: 1♀, Banff (Sanson) / *Chrysopa oculata* / Teste N. Banks / [hand-written] (376) / ♀, *Chrysopa pleuralis* Bks, Det. P. Adams [CNC].

104. Not to be confused with The Fortress, a mountain in Kananaskis Country AB, 50°50'N 115°14'W. Fortress Mountain in Jasper National Park of Canada straddles the Continental Divide between Alberta and British Columbia, and has the coordinates 52°24'N 117°43'W.

105. "This is very likely Botanie Valley. Botanie Creek flows south into the Thompson River near its junction with the Fraser River at Lytton. Botanie Lake is at the head of Botanie Creek and Botanie M[oun]t[ain] is also in the area. Bootahnie Indian reserve No. 15 is north of Botanie Lake. Map Reference N.T.S. Sheet 92 I/5 at 1:50,000 scale." Mr. D.F. Pearson, BC Representative, Canadian Permanent Committee on Geographical Names, *in litt.* 22.vii.1980



## **CHRYSOPEA QUADRIPUNCTATA Burmeister, 1839**

*Chrysopa quadripunctata* Burmeister, 1839: 980. Type: NORTH AMERICA; original designation; sex unknown, deposited in Halle [Germany: Halle an der Saale] (Penny *et al.* 1997).

### **SYNONYMY PERTAINING TO CANADA**

*Chrysopa quadripunctata*: Walker 1853: 246; Smith 1932: 597; Putman 1932b: 121–126; Spencer 1942: 27; Garlick 1955: 282, 326–327, 329; Bickley and MacLeod 1956: 194; Bram and Bickley 1963: 8–9; Lafrance 1970b: 38, pl. 14; Throne: 1971: 70; Garland 1982 [1984]: 143–148, 314–315, Figs. 48–50, 73, Map 10; 1984: 93; 1985a: 737–751; Penny *et al.* 1997: 51.

**CANADA: T = 74** (43♂, 27♀, 4?) + 10 larvae. **FIRST RECORD**: BC: 1♂, Vanc[ouver] Island, 2.vi.[18]88 (G.W. Taylor) / (Det. Smith) / (*Chrysopa quadripunctata* Burm., Det. R.C. Smith) [CNC]. **FLIGHT PERIOD**: May 26 (1965; Rondeau Provincial Park ON)–September 22 (1961; Ste-Anne-de-Bellevue QC).

**BC: T = 2** (1♂, 1?). **FIRST RECORD**: 1♂, Vanc[ouver] Island, 2.vi.[18]88 (G.W. Taylor) / (Det. Smith) / (*Chrysopa quadripunctata* Burm., Det. R.C. Smith) [CNC]. **FLIGHT PERIOD**: June 2–4 (1888; Vancouver Island). **LOCALITIES**: Vanc[ouver] Island [49°30'N 125°30'W; CNC].

**MB: T = 25** (21♂, 3♀, 1?). **FIRST RECORD**: 1? [abdomen missing], Rennie, 6-8-[19]61 / (Fl[u]or[escent] Lamp, 6-8-61) [NFRFC]. **NEW RECORDS**: 1? [abdomen missing], Rennie, 6-8-[19]61 [collector unknown] / (Fl[u]or[escent] Lamp, 6-8-61) [NFRFC]. 4♂, Rennie, Light Trap, 23.vi.1962 [collector unknown; hand-written, underside of label with the letter (P)<sup>106</sup>] [CNC]. 1♂, Rennie, Light Trap, 23-6-1962 [collector unknown], [hand-written, underside of label] (P) / (*Chrysopa rufilabris* Burm., Det. J.A.D.) [NFRFC]. 4♂, 1♀, Rennie, Light Trap, 29.vi.1962 [collector unknown; hand-written, underside of label with the letter (P)] [CNC]. 1♂, Rennie, Light Trap, 6.vii.1962 [collector unknown; hand-written, underside of label with the letter (P)] [CNC]. 1♂, Rennie, Light Trap, 21.vii.1962 [collector unknown; hand-written, underside of label with the letter (P)] [CNC]. 8♂, Rennie, Light Trap, 29.vii.1962 [collector unknown; hand-written, underside of label with the letter (P), all except two specimens] [CNC]. 1♂, 1♀, Rennie, Light Trap, 29-7-1962 [collector unknown], [hand-written, underside of label] (P) [NFRFC]. 1♂, 1♀, Rennie, Light Trap, 10.viii.1962 [collector unknown; hand-written, underside of label with the letter (P)] [CNC]. **FLIGHT PERIOD**: June 23–August 10 (1962; Rennie, Light Trap). **LOCALITIES**: Rennie [49°51'10"N 95°33'10"W; CNC, NFRFC].

**NS: T = 2** (♂). **FIRST RECORD / NEW RECORDS**: 1♂, Willowdale, 13.vii.1947 (J.T.B. Kingston) / (By lantern) / [hand-written] (18) / [type-written] (3–4) / [type-written] (U.N.B.4) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [type-written] (2581) / (*Chrysopa ?slossonae* Banks, ♂, Det. P. Adams) / [hand-written] (This spec[ies] has entoprocesses more curved at apex than in Tauber's *slossonae*, but still not so angulate as in 4-punctata) [genitalia in microvial pinned with the specimen; CNC<sup>107</sup>]. **FLIGHT PERIOD**: July 13 (1947; Willowdale)–September 5 (1956; Green Bay). **LOCALITIES**: Green Bay [44°13'N 64°26'W; NSM]. Willowdale [45°24'N 62°13'W; CNC].

**ON: T = 31** (11♂, 19♀, 1?). **FIRST RECORD**: 1♀, Biscotasing, 14.vii.1931 (Karl Schedl) / (19283 / 73) / (*Chrysopa quadripunctata* Burm., Det. P. Adams) [CNC]. **NEW RECORDS**: 1♀, S[ain]t Lawrence Is[lands] Nat[ional] Park, Lindsey Is[land] / Code 4423-E, 15.viii.1976 (Carter) [CNC]. 1♂, S[ain]t Lawrence Is[lands] Nat[ional] Park, Thwartway Is[land] / Code 4484-N, 20.viii.1976 (Reid) [CNC]. **FLIGHT PERIOD**: May 26 (Rondeau Provincial Park)–September 2 (1931; St. Davids). **LOCALITIES**: Biscotasing [47°17'N 82°06'W; CNC]. Bobcaygeon [44°33'N 78°33'W; CNC]. Chaffey's Locks [44°35'N 76°19'W; ROM]. Dundas Marsh, Hamilton [Dundas, 43°16'N 76°58'W; MCMU]. Georgian Bay Island 421 [Georgian Bay Islands National Park of Canada, 44°53'N 79°52'W; UG]. Marmora [44°29'N 77°41'W; CNC, UG]. Niag[ara] Falls [43°06'N

106.P = Life-Table Plot. Traps were serviced weekly by staff at the CFS Whiteshell Field Station on Red Rock Lake; one of us (JAG) worked there as a Technical Officer in the summer of 1964

107.Forewings missing; hindwings and abdomen on a label pinned with the specimen [CNC].

79°04'W; UG]. Niagara-on-Lake [Niagara-on-the-Lake, 43°15'N 79°04'W; UG]. Port Credit [43°33'N 79°35'W; ROM]. P[or]t Dover [42°47'N 80°12'W; UG]. Rondeau Prov[incial] P[ar]k [42°17'N 81°52'W; ROM]. S[ain]t Davids [43°10'N 79°07'W; UG]. S[ain]t Lawrence Is[lands] Nat[ional] Park, Lindsey Is[land], Code 4423-E [Lindsay Island, 44°18'N 76°11'W; CNC]. S[ain]t Lawrence Is[lands] Nat[ional] Park, Thwartway Is[land], Code 4484-N [Leek Island, 44°18'N 76°09'W; CNC]. Toronto [43°42'N 79°25'W; ROM].

**PE: T = 1** (♀). **FIRST RECORD:** 1 ♀, Dalvay House, Can[adian] Nat[ional] Park, 20.vii.1940 (G.S. Walley) [CNC]. **FLIGHT PERIOD:** July 20 (1940; Dalvay House, Canadian National Park). **LOCALITIES:** Dalvay House, Can[adian] Nat[ional] Park [Dalvay-by-the-Sea Hotel National Historic Site, 46°24'54"N 63°04'15"W; CNC].

**QC: T = 12** (8♂, 3♀, 1?) + 10 larvae. **FIRST RECORD:** 1 ? [abdomen missing], Shawbridge, 24.vii.1926 (A.F. Winn) [LEM]. **FLIGHT PERIOD:** June 24 (1976; Laval)–September 22 (1961; Sainte-Anne-de-Bellevue). **LOCALITIES:** Covey Hill [45°01'06"N 73°45'20"W; CNC]. Ile Perrot [L'Île-Perrot, 45°23'N 73°57'W; LEM]. Laval [45°35'N 73°45'W; LEM]. Masham Mills [Masham, 45°41'N 76°05'W; ROM]. Mont S[ain]t Hilaire [Saint-Hilaire, 45°33'30"N 73°11'54"W; LEM]. Parc du Mont Tremblant [Mont-Tremblant, Parc national du, 46°26'N 74°21'W; UdeM<sup>108</sup>]. S[ain]te Anne de Bellevue [Sainte-Anne-de-Bellevue, 45°24'N 73°56'W; LEM]. Shawbridge [45°52'17"N 74°04'45"W; LEM].

**SK: T = 1** (♀). **FIRST RECORD:** 1 ♀, Fort Qu'Appelle, 21.vi.1977 (R. Hooper) [SMNH]. **FLIGHT PERIOD:** June 21 (1977; Fort Qu'Appelle). **LOCALITIES:** Fort Qu'Appelle [50°46'N 103°48'W; SMNH].

*Chrysopa quadripunctata* has been reported from British Columbia, Saskatchewan, and eastern Canada; now also Manitoba.<sup>109</sup> Canadian localities in literature for which no specimen has been seen, are: ON: St. Martin's Falls,<sup>110</sup> Albany River, Hudson Bay (Walker 1853),<sup>111</sup> and Vineland (Garlick 1955). All specimens reported here are documented with data in Garland (1982 [1984]), or as new records (above). Based on label data, adults have been taken at light, and in Malaise trap. The labels are silent, however, about the habitat; nevertheless, all areas of Canada where this species has been authenticated have naturally occurring *Quercus* species (Farrar 1985), including the Qu'Appelle Valley in eastern Saskatchewan.<sup>112</sup> Oak may not extend as far north as Martin Falls ON, but the literature record from there still merits consideration. This species was once thought to occur only on or near oak trees (Banks 1903; Smith 1922). It can be distinguished from *Chrysopa slossonae* Banks, a similar-appearing species, by the forewing costal area, which at its widest is as wide as the radial area (Banks 1924), i.e., the costal cells are three times as long as wide (Penny *et al.* 2000). Recent study suggests that *C. quadripunctata* is a generalist predator on a variety of annual plants, trees and shrubs, including oak, hickory, apple, elm, rose and sorghum, and its broad range of prey includes various species of aphids and other soft-bodied insects that may or may not be tended by ants, in contrast to *C. slossonae*, which feeds only on the woolly alder aphid<sup>113</sup> (Tauber *et al.* 1995, and references therein). Biology and immature stages of *C. quadripunctata* have been studied in California (Toschi 1965), and from diverse locations in the USA (Tauber *et al.* 1995; Albuquerque *et al.* 1997).

108. Record consists of 10 first-instar larvae. Determined by C.A. Tauber *in litt.* 1980.

109. Besides the records listed here, one of us (JAG) saw two specimens labelled as this species in a wall-mounted collection in the Department of Entomology, University of Manitoba, in 1980.

110. ON: St. Martin's Falls, Albany River [Martin Falls; 51°32'N 86°30'W].

111. Walker (1853) reported the specimen in the collection of the British Museum of Natural History; it could not be located there (BMNH, P.C. Barnard *in litt.* 1979).

112. In 1969, one of us (JAG) observed Bur oak, *Quercus macrocarpa* Michx., growing along the north shore of the Qu'Appelle River at Fort Qu'Appelle SK. Also, a new record of *Chrysoperla carnea* (CNC; below) corroborates the occurrence of Bur oak in the Qu'Appelle Valley, at Ox Bow SK. For some decades, oak has been distributed on the prairies by the Prairie Farm Rehabilitation Act (PFRA), being grown at the PFRA Tree Nursery located at Indian Head SK.

113. The woolly alder aphid, *Paraprociophilus tessellatus* (Fitch), occurs in Canada (Maw *et al.* 2000).

## GENUS *CHRYSOPERLA* Steinmann, 1964

*Chrysopa* (*Chrysoperla*) Steinmann, 1964: 260 [proposed as subgenus of *Chrysopa* Leach]. Type species: *Chrysopa carnea* Stephens, 1836; original designation.

*Chrysoperla* (Steinmann, 1964): Séméria 1977: 238.

*Chrysoperla* is widely distributed, but does not occur in Australia or New Zealand (New 2001; McEwen *et al.* 2001). Brooks (1994) recognised 36 valid species in four species groups. According to McEwen *et al.* (2001), “The widely distributed species, in particular, may be ranked among the most widespread and popular predators of small arthropods in many crop contexts.” The larvae feed on aphids and coccids, whereas the adults are thought to feed primarily on honeydew (Brooks 1994); adults in the genus are known to feed opportunistically as “leaf scrapers” or on pollen (Sheldon and Macleod 1971, as *Chrysopa carnea* and the *carnea*-group). Larvae are naked (Brooks 1994; Monserrat *et al.* 2001). Larvae of North American species [perhaps not all] have been described (Tauber 1974). Adults of all species overwinter (Séméria 1977; Brooks 1994), and some change colour from green to brown or reddish-brown in their winter phase (Brooks and Barnard 1990; Henry *et al.* 2001). In this study, the *carnea*-group is treated as *Chrysoperla carnea* (Stephens), following Tjeder (1960), who reminded us that, in 1957, “the [U.S.] Department of Agriculture introduced palaearctic *Chr. carnea* into the United States, releasing numbers of specimens in many states in both the western and eastern parts of the country, as a possible control for the spotted alfalfa aphid. The nearctic population of *carnea* has thus been mixed with the introduced palaearctic population of the same species and it will no doubt be impossible to state from which of these populations specimens collected in or after the year 1957 will belong.” Research into non-morphological diagnostic methods is still in progress (Brooks and Barnard 1990; Brooks 1994; Henry *et al.* 1999, 2001; McEwen *et al.* 2001; Kluge 2005). Until the *carnea*-group can be resolved, three *Chrysoperla* species are here considered to occur in Canada, as follows:

### *CHRYSOPERLA CARNEA* (Stephens, 1836), *SENSU LATO*

*Chrysopa carnea* Stephens, 1836: 103. Lectotype: female; UNITED KINGDOM: England (near London); BMNH; designated by Leraut 1991: 78.

*Chrysoperla carnea* (Stephens, 1836): Séméria 1977: 238.

### SYNONYMY PERTAINING TO CANADA

*Chrysopa californica*: Anonymous 1906: 3.

*Chrysopa carnea*: Wilde 1962: 847; Putman 1963a: 37; 1963b: 109; Wilde 1963: 48–49; Judd 1964: 990; Herne and Putman 1966: 937, 939; Putman and Herne 1966: 811–812; Judd 1967: 54; McMullen and Jong 1967a: 35, 36; 1967b: 1293; McMullen 1971: 34; C.A. Tauber and Tauber 1973: 1159–1163, 1165; New 1975: 124, 129; Bucher and Bracken 1978: 26–30; Philogene and Chang 1979: 56; Burgess 1980: 745–746; C.A. Tauber and Tauber 1982: 54–58, 68 [the *Carnea* Type].

*Chrysopa downesi*: Smith 1932: 594–595, 601; W.J. Brown 1934: 141; Spencer 1942: 27; Bickley and MacLeod 1956: 193; MacLeod 1967: 1348; Tauber 1974: 1145, 1148.

*Chrysopa externa*: Saunders 1875: 153; Brodie and White 1883.

*Chrysopa harrisii*: Smith 1932: 595–596 (part); Foster 1942: 22; Spencer 1942: 27; Bickley and MacLeod 1956: 193; Throne 1971: 73 (part).

*Chrysopa harrisii externa*: Smith 1932: 596; Spencer 1942: 27; Robinson 1952: 36.

*Chrysopa plorabunda*: Putman 1932a: 44–45; 1932b: 121–126; Smith 1932: 584 (part: footnote 4), 593, 601; Ross and Putman 1934: 37; Putman 1937: 29–37; Spencer 1942: 27; Garlick 1955: 281–282, 326–328; Putman 1955: 24; Bickley and MacLeod 1956: 192–193; Putman 1956: 520; Putman and Herne 1958: 668, 670–671; 1960: 200, 201; Dustan 1961: 224.

*Chrysopa plorabunda californica*: Smith 1932: 594; Spencer 1942: 27; Robinson 1952: 36.

*Chrysopa sperryae*: Bickley and MacLeod 1956: 194.

*Chrysoperla carnea*: Garland 1982 [1984]: 213–234, 377–406, 414, 418, Figs. 74, 91–98, Map 18; 1984: 93; 1985a: 737–751, 753–755, 757, 759; 1989: 181–183; 2000: 40.

*Chrysoperla downesi*: Henry 1985: 31; Brooks 1994: 151–152 (part); Penny *et al.* 1997: 51 (part).

*Chrysoperla plorabunda*: Henry 1985: 31; Brooks 1994: 150 (part); Penny *et al.* 1997: 52 (part).

# SYNONYMY PERTAINING TO USA-ALASKA

*Chrysopa carnea*: C.A. Tauber and Tauber 1982: 54–59, 61, 67–68 [Alaska Population].

*Chrysopa harrisii*: Bickley and MacLeod 1956: 193; Throne 1971: 73; Penny *et al.* 1997: 52.

*Chrysopa plorabunda*: Bickley and MacLeod 1956: 192–193; Penny *et al.* 1997: 52.

*Chrysoperla carnea*: Garland 1982 [1984]: 377, Figs. 92a, 94d–f, 95b, 97a–b, 98d.

**CANADA: T = 1748** (611♂, 1020♀, 117?) + 29 larvae. **FIRST RECORD:** BC: 2♂, Wellington, 14.v.1897 [collector unknown; MCZ]. **NEW RECORDS:** (Province unknown): 1♀, Rec[eived] 2.vii.1937 (F.I.Survey 1937, Record No. 712) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [hand-written] (2202) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♀, Rec[eived] 16.ix.1937 (F.I.Survey 1937, Record No. 2851) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / [type-written] (2614) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♀, R[e]c[eive]d 6.vii.1938 (F.I.Survey 1938, Rec[ord]: 3826) [collector unknown] / (*Chrysopa plorabunda* Fitch, Det. WCM<sup>114</sup>) / [hand-written] (O 14) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1? [abdomen missing], Em[erged] 6.ix.1938 (F.I.Survey 1938, Rec[ord]: 5946) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [type-written] (2605) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♂, R[e]c[eive]d 19.viii.1939 (F.I.Survey 1939, Rec[ord]: 8686) [collector unknown] / (*Chrysopa plorabunda* var. *californica* Coq., Det. WCM<sup>115</sup>) / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [type-written] (2604) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♂, R[e]c[eive]d 31.viii.1939 (F.I.Survey 1939, Rec[ord]: 9110) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [hand-written] (2176) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♂, R[e]c[eive]d 5.ix.1939 (F.I.Survey 1939, Rec[ord]: 9174) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [type-written] (2606) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♀, R[e]c[eive]d 5.ix.1939 (F.I.Survey 1939, Rec[ord]: 9163) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / [type-written] (2613) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♀, R[e]c[eive]d 6.viii.1940 (F.I.Survey 1940, Rec[ord]: 2152) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / [type-written] (2612) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♀, R[e]c[eive]d 11.vi.1941 (F.I.Survey 1941, Rec[ord]: 3732) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [type-written] (2609) / (*Chrysopa carnea* Steph., Det. P. Adams) [genitalia in microvial pinned with specimen; CNC]. 1♂, R[e]c[eive]d 17.viii.1942 (F.I.Survey 1942, Rec[ord]: 7170) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [hand-written] (2201) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1? [abdomen missing], R[e]c[eive]d 8.ix.1942 (F.I.Survey 1942, Rec[ord]: 7481) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [type-written] (2607) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♂, R[e]c[eive]d 8.ix.1942 (F.I.Survey 1942, Rec[ord]: 7481) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [type-written] (2608) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1? [abdomen missing], Date: 9.ix.1946 (F.I.S. 1946, No. 46-3703) / (F.I.S. 175, Div[ision] 28, White Pine) / [hand-written] (O 3) / [paper rectangle with a green and yellow band at one end,

114.WCM : W.C. McGuffin.

115.WCM : W.C. McGuffin.



not inscribed] / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♂, [hand-written] (47-463C, Jul. 30/47 [1947]) / [type-written] (BC68) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / (*Chrysopa carnea* Steph., Det. P. Adams) [cocoon pinned with specimen; genitalia in microvial pinned with specimen; CNC]. 1♀, [hand-written] (47-627, July 23 '47 [1947]) / [type-written] (BC58) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [cocoon pinned with specimen; CNC]. **FLIGHT PERIOD:** April 4 (1976; Penticton BC)–November 30 (1938; Vancouver BC).

**AB: T = 155** (59♂, 76♀, 20?) + 1 larva. **FIRST RECORD:** 1 ?, Lethbridge, 20.ix.1913 (E.H. Strickland) [CNC]. **NEW RECORDS:** 1? [abdomen missing], Caroline, (F.I.S. W-395-B, Em[erged] 18.viii.[19]45 [collector unknown], Host: White Spruce) / (*Chrysopa plorabunda* Fitch, Det. Brooks [19]62) [NFRC]. 1? [abdomen damaged], Edmonton, 25 Jan[uary] [19]79 [collector unknown] [NFRC]. 1? [abdomen missing], Embarras, W[hite] Spruce / (F.I.S. 1950, No. A3108, Date 2.ix.[19]50 [collector unknown]) [NFRC]. 1♀, Fox Creek, 80 km S [of] Valleyview, Spruce-Aspen forest, intercept [trap], 12.vi.–7.ix.[19]84 (S. & J. Peck) [CNC]. 1 ♂, Grande Prairie, 12.vii.1940 (C.L. Neilson) / [type-written] (1035) [CNC<sup>116</sup>]. 1? [abdomen missing], Leadale, [Host] (?) / (F.I.S. 1952, No. A2202, Date 6.x.[19]52 [collector unknown]) [NFRC]. 1♀, Lethbridge, (F.I.S., 7.ix.[19]65 [collector unknown]) / (Vetch, 65A1642-04) [NFRC]. **FLIGHT PERIOD:** April 10 (1914; Midnapore)–October 6 (1952; Leadale). **LOCALITIES:** Banff Nat[ional] P[ar]k, Banff [Banff, 51°10'N 115°34'W; CNC]. Beaverlodge [55°13'N 119°26'W; CNC, UAE, UG]. Belly River Ranger Station [Belly River, 49°46'N 113°02'W; CNC]. Bilby [53°42'N 114°06'W; CAS]. Calgary [51°03'N 114°05'W; CNC, UMW]. Caroline [52°05'N 114°45'W; NFRC]. Chip Lake [53°37'N 115°26'W; CNC]. Claresholm [50°02'N 113°35'W; CNC]. Clymont [Clymont Community Hall, N of Devon, 53°22'N 113°44'W; UAE]. Cochrane [51°11'N 114°28'W; CNC]. Colinton [54°37'17"N 113°15'00"W; CNC]. Cow Cr[ee]k [conflicting place names; CNC]. Crowsnest Lake [49°38'N 114°38'W; CNC]. Cypress Hills [Cypress Hills, Mountain in AB, 49°34'N 110°08'W; CNC]. Delburne [52°12'N 113°14'W; UG]. Dovercourt [52°15'N 114°51'W; CNC, NFRC]. Drumheller [51°24'30"N 112°38'40"W; CNC]. Edmonton [53°33'N 113°28'W; NFRC, PIDAA, UAE, UMW]. Edson [53°35'N 116°26'W; CNC]. Elkwater [49°40'N 110°17'W; CNC]. Elkwater P[ar]k [Cypress Hills Interprovincial Park, 49°38'N 110°12'W; CNC]. Embarras [53°18'N 116°54'W; NFRC]. Entrance [53°22'N 117°41'W; CNC]. Entwistle [Entwistle, 53°36'N 115°00'W; CNC]. Fawcett [54°32'N 114°05'W; CNC]. Fort Assiniboine [54°20'N 114°46'W; CNC]. Fox Creek, 80 km S [of] Valleyview [Fox Creek, 54°24'N 116°48'W; CNC]. Gleichen [50°52'N 113°03'W; UG]. Grande Prairie [55°10'N 118°48'W; CNC]. High Prairie [55°26'N 116°29'W; CNC]. Horburg [52°25'N 115°17'W; CNC]. Jasper P[ar]k, Fiddle Creek [Jasper National Park of Canada, 52°59'N 118°06'W; CNC]. Jasper P[ar]k, Pocahontas area / Jasper P[ar]k, Pocahontas District [Pocahontas, unincorporated area, 53°12'N 117°55'W; CNC]. Jasper [52°53'N 118°05'W; CNC]. Kinuso [55°20'N 115°25'W; CNC]. Lac la Biche [54°46'N 111°58'W; CNC]. L[ake] Minnewanka [Minnewanka, Lake, 51°15'N 115°23'W; CNC]. Leadale [Leadale, 52°35'N 114°29'W; NFRC]. Lethbridge [49°42'N 112°49'W; CNC<sup>117</sup>, NFRC, UAE]. Medicine Hat [50°03'N 110°40'W; CNC, UAE]. Midnapore [50°55'N 114°05'W; CNC]. Miette Hot S[prings] [Miette Hotsprings, 53°08'N 117°46'W; CNC]. Minnewanka [Lake] [51°15'N 115°23'W; CNC]. M[oun]t Laurel, Waterton [Waterton Lakes National Park of Canada, 49°05'N 113°52'W; CNC]. Nordegg, 28 mi[les] W [52°28'N 116°05'W; CNC]. 1-4 [Onefour, 49°07'N 110°28'W; CNC]. Peace River, Athabasca [56°15'N 117°17'W; MCZ]. Pedley [53°28'N 117°27'W; CNC]. Red Deer [52°16'N 113°48'W; CNC]. Reno [56°00'N 117°00'W; CNC]. Rocky, 27 mi[les] SW [Rocky Mountain House, 52°22'N 114°55'W; CNC]. Salway [unknown locality; CNC]. Saunders, 12 mi[les] W [52°27'N 115°44'W; CNC]. Seebe [51°06'N 115°04'W; CNC]. Smith, 20 mi[les] SE [Smithmill, 56°28'N 117°47'W; CNC]. Stettler [52°19'N 112°43'W; USS]. Sundre, 20 mi[les] W [Sundre, 51°48'N 114°38'W; CNC]. Sylvan Lake [52°19'N 114°05'W; CNC]. Tawatineau [Tawatinaw, 54°18'N 113°29'W; CNC]. Valleyview [55°04'N 117°17'W; CNC]. Waterton [Water-

116. Garland 1982 [1984]: 398, line 13: Grande Prairie AB: 1? and 1? [abdomen missing], same data; the new record makes the total collected by C.L. Neilson, same data = 3 (2?, 1?) [CNC].

117. Includes Paratype(s) of *Chrysopa downesi* Smith.

ton Lakes National Park of Canada, 49°05'N 113°52'W; CNC]. Whitecourt [54°09'N 115°41'W; CNC]. Wildwood [conflicting place names; CNC]. Yahatinda Ranch, 14 mi[les] E [Ya Ha Tinda Ranch<sup>118</sup>] [Sundre, 51°48'N 114°38'W; CNC].

**BC: T = 535** (172♂, 319♀, 44?). **FIRST RECORD:** 1♂, Wellington, 14.v.1897 [collector unknown; MCZ Banks Collection].<sup>119</sup> **NEW RECORDS:** (Locality unknown): 1♀, R[e]c[eive]d 24.ix.1938 (F.I.Survey 1938, Rec[ord]: BC 429) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / [hand-written] (2203) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♀, R[e]c[eive]d 22.viii.1939 (F.I.Survey 1939, Rec[ord]: BC 1215) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / [hand-written] (2204) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♂, R[e]c[eive]d 18.ix.1940 (F.I.Survey 1940, Rec[ord]: BC 1985) [collector unknown] / [type-written] (BC27) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♀, R[e]c[eive]d 19.ix.1939 (F.I.Survey 1939, Rec[ord]: BC 1337) [collector unknown] / [type-written] (BC40) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♀, R[e]c[eive]d 14.ix.1940 (F.I.Survey 1940, Rec[ord]: BC 1973) [collector unknown] / [type-written] (BC25) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♀, R[e]c[eive]d 18.ix.1940 (F.I.Survey 1940, Rec[ord]: BC 1985) [collector unknown] / [type-written] (BC28) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / [hand-written] (2158) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♂, R[e]c[eive]d 17.ix.1941 (F.I.Survey 1941, Rec[ord]: BC 2881) [collector unknown] / [type-written] (BC35) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♂, Beaverdell, larch bark, 22.xii.[19]75 (B[ritish] C[olumbia] F[orest] S[ervice]) [collector unknown; PFRC]. 1♂, Cowichan L[a]k[e], D[oug]las fir, 27.xii.[19]73 [PFRC]. 1♀, Fruitvale, 11.vii.1970 (L.A. Kelton) [CNC]. 1♀, Honeville, *P[seudotsuga] taxifolia* / (F.I.S. 1951, No. 51-1868, Date 31.vii [1951]) [collector unknown; CNC]. 1♂, Kamloops, 6.x.1949 (L.C. Curtis) [CNC]. 1♂ [teneral], Kootenay Nat[ional] Park, betw[een] Kays & [and] McLeod M[ea]d[o]ws, on *Picea*, em[er]ged 25.ix.1944 (F.I.Survey 1944, Record No. BC 44-588) [collector unknown] / [type-written] (365) / [type-written] (60-176) [CNC]. 1♀, Osoyoos, Haynes E[cological] R[eserve], 2.ix.2002-14.iv.2003 (G.G.E. Scudder) / BGxh1 AN, recovery after fire, pitfall trap LR2-1 [SEM]. 1♂, Penticton, West Bench, 22.viii.1987 (S.G. Cannings) [SEM]. 1♀, Summerland, just N along H[igh]w[a]y 97, 28 .iv.1988 (C.S. Guppy) / (Royal British Columbia Museum ENT991-3513) [BCPM]. 1♀, Vernon, 16.viii.1902 (B.C. LeBlond) [CNC]. 1♀, Vernon, 16.ix.1931 (R.D. Bird) / (Is39, II, 31) [CNC]. 1♂, Victoria, *A[bies] grandis*, 5.vii.1968 (FIS No. 68-2341-01) [collector unknown; PFRC]. 1♀, Victoria, 666 Belton Ave., 3.viii.2000 (G. Keddie) [BCPM]. 1♂, Victoria, 48°27.4'N 123°19.3'W, 28.vi.2004 (Marc Amacher) [BCPM]. **FLIGHT PERIOD:** April 4<sup>120</sup> (1976; Penticton)-November 30<sup>121</sup> (1938; Vancouver). **LOCALITIES:** Alaska H[igh]w[a]y, km 670, Racing River [Racing River, River, 58°55'N 125°03'W; SEM]. Alaska H[igh]w[a]y, 32.1 km E [of] Steamboat [Steamboat, 58°41'N 123°43'W; SEM]. Arras [55°45'N 120°32'W; SEM]. Bald M[oun]t[ain] [conflicting place names; SEM]. Baynes Lake [49°14'N 115°13'W; CNC]. Barriere [Barrière, 51°11'N 120°07'W; CNC]. Beaverdell [49°26'N 119°05'W; PFRC]. Birch Island [51°36'N 119°55'W; CNC]. Bowser [49°26'N 124°40'W; CNC]. Box Lake, n[ea]r Nakusp [50°13'N 117°43'W; CNC]. Charlie L[ake], 25 km W [56°17'N 120°57'W; SEM]. Chase [50°49'N 119°41'W; CNC]. Cherryville [50°14'30"N 118°37'00"W; CNC]. Chilcotin [Chilcotin Training Area, 52°04'51"N 122°33'05"W; SEM]. Chu-Chua, n[ea]r Barriere [Chu Chua, 51°21'N 120°10'W; CNC]. Clinton [51°05'N 121°35'W; CNC].

118. Ya Ha Tinda Ranch: W of Sundre; in 1917 included within the boundaries of Banff National Park, but excised from the Park in 1930 (Morgantini 1995).

119. A second specimen (♂), same data but with label: *Chrysopa carnea* Steph., Det. P. Adams.

120. This was the first of a series of specimens collected by one of us (JAG) at Penticton BC [LEM]; specimens with earlier collecting dates were likely found under bark, as indicated on some labels.

121. Specimens with later collecting dates were likely found under bark, as indicated on some labels.

Comox [49°41'N 124°56'W; CNC]. Cowichan Bay [48°44'N 123°37'W; CNC]. Cowichan L[a]k[e] [Lake Cowichan, 48°49'N 124°03'W; LEM, PFRC, SEM]. Cranbrook [49°30'N 115°46'W; CNC]. Cummings L[ake] [55°05'N 121°57'W; SEM]. Deep Creek, Peachland [Peachland, 49°46'N 119°44'W; CNC]. Deer Park, Lower Arrow Lakes [Deer Park, 49°25'N 118°03'W; CNC]. Departure Bay [49°12'N 123°58'W; SEM]. Duncan, Indian Reserve S of [Duncan, 48°47'N 123°42'W; CNC]. Edgewood [49°47'N 118°09'W; CNC]. Eholt [49°09'30"N 118°32'30"W; CNC]. F[or]t Nelson / F[or]t Nelson, 1367 [58°48'20"N 122°41'50"W; CNC, SEM]. Fruitvale [49°07'N 117°33'W; CNC]. Galiano I[sland], Spanish Hills [Galiano Island, 48°56'N 123°27'W; SEM]. Gibsons [49°24'N 123°30'W; SEM]. Goldstream [Goldstream Land District, 48°26'00"N 123°35'30"W; SEM]. Green Timbers [Green Timbers Forestry Station, New Westminster Land District, 49°44'N 123°05'W; SEM]. Halfway [Halfway Islet, New Westminster, 49°36'N 123°49'W; SEM]. Haney [49°13'N 122°36'W; SEM]. Hazleton, n[ea]r Glenvowel I[ndian] R[eserve] [Glen Vowell, 55°19'N 127°40'W; CNC]. Honeville [unknown locality; CNC]. Huscroft, n[ea]r [49°01'N 116°28'W; CNC]. Kamloops [50°40'N 120°19'W; CNC, MCZ, SEM]. Kaslo [49°55'N 116°55'W; CNC<sup>122</sup>, USNM]. Kelowna [49°53'N 119°29'W; CNC<sup>123</sup>, KSU<sup>124</sup>]. Keremeos [49°12'N 119°50'W; CNC, JEC]. Kettle Valley [49°03'N 118°56'W; CNC]. Kootenay Nat[ional] P[ar]k, McLeod Meadows / Kootenay Nat[ional] Park, betw[een] Kays & [and] McLeod M[ea]d[o]ws [Kootenay National Park of Canada, 50°57'N 116°02'W; CNC]. Kuskanax Creek, Nakusp [Nakusp, 50°15'N 117°48'W; CNC]. Lac du Bois, Kamloops [Lac du Bois Grasslands Park, 50°46'N 120°30'W; SEM]. L[ake] Greene, Kamloops [Green Lake, 49°45'N 120°38'W; SEM]. Ladysmith [48°59'N 123°49'W; CNC]. Langford [48°27'N 123°30'W; CNC, PFRC]. Langley [49°06'N 122°39'W; SEM]. Lemon Creek, Slocan Valley [Lemon Creek, 49°42'N 117°29'W; CNC]. Liard Hot Sp[rin]g / Liard Hot Sp[rin]g, mi[le] 496 Alaska H[igh]w[a]y, 1500 ft [457 m] [Liard Hot Springs, 59°25'40"N 126°06'15"W; CNC, SEM]. Lions Bay, Vancouver [Lions Bay, 49°27'N 123°14'W; SEM]. Louis Cr[ee]k Road, Barriere [Barrière, 51°11'N 120°07'W; CNC]. Lower Post [59°56'N 128°30'W; CNC]. Lytton [50°14'N 121°34'W; UWO]. Madden L[ake], Oliver [Madden Lake, 49°14'N 119°37'W; CNC]. Mandarte I[sland] [48°38'N 123°17'W; SEM]. McMillan Creek, Prince George [McMillan Creek Park, Conservation Area, 53°56'N 122°45'W; CNC]. Mission Flats [Mission, 49°08'N 122°18'W; SEM]. M[oun]t Douglas, Victoria [Douglas, Mount, 48°29'30"N 123°20'45"W; CNC]. M[oun]t Revelstoke [Mount Revelstoke National Park of Canada, 51°06'N 118°04'W; CNC]. Nanaimo / Nanaimo, 5 mi[les] S [49°10'N 123°56'W; CAS, CNC, MCZ, SEM, UWO]. N[ew] West[minster] [49°13'N 122°55'W; UWO]. Noble Creek, n[ea]r Louis Cr[ee]k [Noble Creek, River, 51°08'N 120°05'W; CNC]. Oak Bay, Victoria [Oak Bay, 48°27'N 123°18'W; CNC]. Okanagan Lake [49°45'N 119°44'W; SEM]. Oliver [49°11'N 119°33'W; CNC<sup>125</sup>]. Osoyoos / Osoyoos, 3500 ft [1067 m] / Osoyoos, Haynes E[cological] R[eserve] [49°02'N 119°27'W; SEM]. Pemberton [50°19'N 122°48'W; PFRC]. Penticton<sup>126</sup> [49°30'N 119°35'W; CNC<sup>127</sup>, LEM, SDARS]. Penticton, West Bench [West Bench, 49°30'N 119°37'W; SEM]. Pioneer Mine [50°46'N 122°47'W; CNC]. Point Grey [Grey, Point, 49°16'N 123°16'W; SEM]. Pouce Coupe [55°43'N 120°08'W; CNC]. Powell Lake [50°05'N 124°25'W; CNC]. Powell R[iver] [49°51'N 124°32'W; SEM]. Princeton / n[ea]r Princeton [49°27'30"N 120°30'30"W; CNC]. Quadra I[sland] [50°12'N 125°15'W; SEM]. Quesnel / Quesnel, 4 mi[les] N [53°00'N 122°30'W; CNC, SEM]. Renata [49°26'N 118°06'W; CNC]. Robson [49°20'N 117°41'W; CNC, SEM]. Ross Cr[ee]k [conflicting place names; CNC]. Rossland [49°05'N 117°48'W; CNC]. Royal Oak [48°29'N 123°23'W; CNC]. Saanich District [Saanich, 48°33'N 123°22'W; SEM]. S[ain]t Marys [Saint Mary's Indian Reserve 1A, Kootenay, 49°35'N 115°45'W; CNC]. Salmon Arm [50°42'N 119°16'W; BCPM<sup>128</sup>, CNC<sup>129</sup>, KSU<sup>130</sup>, SEM<sup>131</sup>]. Sechelt, Indian Reserve [Sechelt

122. Includes Paratype(s) of *Chrysopa downesi* Smith.

123. Includes Paratype(s) of *Chrysopa downesi* Smith.

124. Includes Paratype(s) of *Chrysopa downesi* Smith.

125. Includes Paratype(s) of *Chrysopa downesi* Smith.

126. Garland 1982 [1984]: 383, line 9: 12.v.1976, and 16.v.1976, should read: 12.vi.1976, and 16.vi.1976.

127. Includes Paratype(s) of *Chrysopa downesi* Smith.

128. Includes Paratype(s) of *Chrysopa downesi* Smith.

129. Includes Paratype(s) of *Chrysopa downesi* Smith.



Indian Government District, 49°28'45"N 123°44'30"W; CNC]. Seton Lake, Lillooet [50°41'N 122°07'W; CNC<sup>132</sup>]. Shuswap Falls [50°18'N 118°49'W; SEM]. Skeena Crossing [55°05'N 127°48'W; CNC]. Smith R[iver] [59°53'N 126°26'W; CNC]. Soda Creek [52°21'N 122°17'W; SEM]. Sonora I[sland], Owen Bay [Sonora Island, 50°22'N 125°15'W; SEM]. South Okanagan [locality unspecified; CNC]. Spences Bridge, 15 mi[les] E [50°25'N 121°21'W; CAS]. Steelhead [49°14'N 122°19'W; SEM]. Sugar Lake [50°24'N 118°31'W; CNC]. Summerland / Summerland, N on H[igh]w[a]y 97 [49°36'N 119°40'W; BCPM, CNC, ROM, SDARS, SEM]. Swinton / Swinton, n[ea]r Morrisey [unknown locality; CNC]. Trinity Valley [50°24'N 118°55'W; CNC]. U[niversity of] B[ritish] C[olumbia] [Vancouver, 49°15'N 123°07'W; SEM]. U[niversity of] B[ritish] C[olumbia] Forest [Garibaldi Park, 50°00'N 122°45'W; SEM]. Upper Arrow Forest, Trout Lake [Trout Lake, 50°38'50"N 117°32'20"W; CNC]. Vancouver [49°15'N 123°07'W; CNC, SEM]. Vaseaux L[ake], Oliver [Vaseux Lake, 49°17'N 119°32'W; CNC]. Vernon / Vernon, BX range, 2000 ft [607 m] [50°15'30"N 119°16'00"W; CNC<sup>133</sup>, MCZ<sup>134</sup>, SEM<sup>135</sup>]. Victoria [48°26'N 123°22'W; CNC<sup>136</sup>, MCZ, PFRC, SEM]. Victoria, 48°27'40"N 123°19'30"W [BCPM]. Wallhachin [50°45'N 120°59'W; SEM]. Wellington [49°12'N 124°02'W; CNC, MCZ]. W[est] Crescent Valley, dry, 3000 ft [914 m], 49°24'N 117°39'W [Crescent Valley; SEM]. W[est] Vancouver [49°22'N 123°10'W; SEM]. Westwick L[akes], Cariboo [52°00'N 122°10'W; SEM]. Williams Lake, 5 mi[les] N [52°08'30"N 122°08'30"W; CNC]. Winslow<sup>137</sup> [Trout Creek, 49°34'N 119°37'W; SEM]. Wood Creek, 2 km N [of] Toad River, 1361 [Toad River, 58°51'N 125°14'W; SEM]. Yale [49°33'N 121°26'W; CNC]. Yoho [National] P[ar]k, Ottertail [Ottertail, 51°19'N 116°33'W; CNC].

**MB: T = 372** (139♂, 208♀, 25?) + 25 larvae. **FIRST RECORD:** 1♀, Winnipeg, 7.x.1910 (J.B. Wallis) [MCZ]. **NEW RECORDS:** 1♀, Ashville, ([F.I.S.] Inc[losure] W67, 4387-01, Em[erged] 5-9-[1967]) [collector unknown] / (*Fraxinus pennsylvanica*, W67, 4387-01) [NFRC]. 1♀, Beulah, (F.I.S. [W66] 1082, Rec[eived] 27-6-66 [1966]) / (*Betula papyrifera*, W66, 1082) / [type-written] (11) [collector unknown; CNC]. 1♂, Brandon, 14.iv.[19]52 (C.F. Barrett) [NFRC]. 1♀, Flin Flon, (F.I.S.: W-918, Em[erged] 5.viii.[19]47 [collector unknown], Host: Black Spruce) / [type-written] (50) [cocoon pinned with specimen; NFRC]. 1♀, Glenboro, ([F.I.S.] Inc[losure] W67, 4336, Em[erged] 5-9-[1967]) [collector unknown] / (*Quercus macrocarpa*, W67, 4336) [NFRC]. 1♀, Grandview, (F.I.S.: W-0040, Rec[eived] 21.v.[19]51 [collector unknown], Host: W[hite] Spruce) [NFRC]. 1♂, 1♀, <sup>138</sup> Lake Winnipeg, Grand Beach, 22.viii.[19]90 / (P. J. Tauber, Collector) / (M.J. & C.A. Tauber Lot 90:51) [TAUBER<sup>139</sup>]. 1♂, Lyleton, (F.I.S. [W66] 3018, Rec[eived] 32[sic]-8-66 [1966]) / (*Picea pungens*, W66, 3018) / [type-written] (5) [collector unknown; CNC]. 1♀, Lyleton, (F.I.S. [W66] 3019, Rec[eived] 22-8-66 [1966]) / (*Ulmus americana*, W66, 3019) / [type-written, underlined by hand] (6) [collector unknown; CNC]. 1? [abdomen damaged], Lyleton, (F.I.S. [W66] 3034, Rec[eived] 22-8-66 [1966]) / (*Fraxinus pennsylvanica*, W66, 3034) / [type-written] (12) [collector unknown; CNC]. 1♀, Mafeking, (F.I.S.: W-0503, Rec[eived] 6.vi.[19]51 [collector unknown], Host: B[lack] Spruce) [NFRC]. 3♂, 3♀, Maple Leaf Prov[incial] C[a]mpg[roun]d, 6 mi[les] E [of] Portage la Prairie, ix.[19]72 (M. K. Kennedy, Coll[ector]) [TAUBER<sup>140</sup>]. 11? [males and females], Maple Leaf Prov[incial] C[a]mpg[roun]d, 6 mi[les] E [of] Portage la Prairie / (lab-reared [1972], M.J. & C.A. Tauber Lot 72:57) [TAUBER<sup>141</sup>]. 1♂, Minitonas, ([F.I.S.] Inc[losure]

130. Includes Paratype(s) of *Chrysopa downesi* Smith.

131. Includes Paratype(s) of *Chrysopa downesi* Smith.

132. Includes Paratype(s) of *Chrysopa downesi* Smith.

133. Includes Holotype (♀) and Paratypes of *Chrysopa downesi* Smith.

134. Includes Paratype(s) of *Chrysopa downesi* Smith.

135. Includes Paratype(s) of *Chrysopa downesi* Smith.

136. Includes Paratype(s) of *Chrysopa downesi* Smith.

137. Winslow Station (11.3 km [Mile Zero is located at Penticton]). "Winslow Station was named after R. M. Winslow of the provincial department of Agriculture who was primarily responsible for the development of the Dominion Experimental Farm. It was established in 1914 to assist the development of the agricultural industry in the unique environmental conditions of the Okanagan Valley. The name was later changed to the Summerland Agricultural Research Station and borders the K[ettle] V[alley] R[ailway] at Winslow Station." (Langford 2002)

138. Both specimens have brown hibernal colour: C.A. Tauber *in litt.* 2006.

139. Label data provided by C.A. Tauber *in litt.* 2006.

140. Label data provided by C.A. Tauber *in litt.* 2006.



W67, 3745(02), Em[erged] 4-9-[1967]) [collector unknown] / (Indian Paint Brush, W67, 3745(02)) [NFRC]. 1♀, Overflow, (F.I.S. [W66] 234, Rec[eived] 6-6-66 [1966]) / (*Abies balsamea*, W66, 234) / [type-written] (25) [collector unknown; CNC]. 1♀, Overflow, (F.I.S. [W66] 1387, Rec[eived] 8-7-66 [1966]) / (*Picea glauca*, W66, 1387) / [type-written] (26) [collector unknown; CNC]. 1♀, Pine Falls, (F.I.S.: W-1579, Rec[eived] 7-7-[19]50 [collector unknown], Host: Balsam [Fir]) [NFRC]. 1♀, Pine Falls, L[ight] T[rap], 27.vi.1961 [collector unknown] [NFRC]. 1♂, Pine Falls, (M #1, 13-7-[19]61 [collector unknown], *Larix laricina*) / (F.I.S., Em[erged] 26-6 [sic]-[19]61) [cocoon pinned with specimen; NFRC]. 1♀, Pine Falls, (P.F. #19, 13-7-[19]61, *Larix laricina*, R[ea]r[e]d) [collector unknown] / (F.I.S., Em[erged] 7-8-[19]61) [cocoon pinned with specimen; NFRC]. 1♂, Pine Falls, (P.F. #25, 13-7-[19]61, *Larix laricina*, R[ea]r[e]d) [collector unknown] / (F.I.S., Em[erged] 7-8-[19]61) [cocoon pinned with specimen; NFRC]. 1♂, Pine Falls, (P.F. #42, 3-8-[19]61, *Larix laricina*, Coll[ected]) [collector unknown] / (F.I.S., [Emerged] 25-8-[19]61) [cocoon pinned with specimen; NFRC]. 1♂, Pine Falls, 10.viii.1961 [collector unknown] [NFRC]. 2♂, 1♀, Pine Falls, L[ight] T[rap], 10.viii.1961 [collector unknown] [NFRC]. 1♀, Pipestone, ([F.I.S.] 1976, Rec[eived] 27-6-1968) [collector unknown] / (Green Ash, W68, 1976) / [type-written] (1) [NFRC]. 1♂, 1♀, Red Rock Lake, em[erged] 4-8-55 [4.viii.1955] [collector unknown] FIS, Host: *Pristiphora erichsonii* [cocoon pinned with specimen; CNC]. 1♂, Rennie, (F.I.S., 12-7-[19]61) [collector unknown] / (*Larix laricina*, Coll[ected], M #3, C.N., 12-7-[19]61) [cocoon pinned with specimen; NFRC]. 1♀, Rennie, (F.I.S., Em[erged] 28-8-[19]61) [collector unknown] / (*Larix laricina*, Coll[ected], M #18, 24-7-[19]61) [cocoon pinned with specimen; NFRC]. 1♀, 1? [abdomen missing], Rennie, (F.I.S., 1-8-[19]61) [collector unknown] / (Fl[u]or[escent] Lamp, 1-8-[19]61) [NFRC]. 1♀, Rennie, (F.I.S., 2-8-[19]61) [collector unknown] / (*Larix laricina*, Coll[ected], M #41, C.P., 2-8-[19]61) [NFRC]. 1♂, Rennie, (F.I.S., 6-8-[19]61) [collector unknown] / (Fl[u]or[escent] Lamp, 6-8-[19]61) [NFRC]. 1♀, Rennie, (F.I.S., 8-8-[19]61) [collector unknown] / (*Larix laricina*, M #48, Coll[ected], 8-8-[19]61) [cocoon pinned with specimen; NFRC]. 1♀, Rennie, (F.I.S., 16-8-[19]61) [collector unknown] / (Fl[u]or[escent] Lamp, 16-8-[19]61) [NFRC]. 2♂, Rennie, (F.I.S., 17-8-[19]61) [collector unknown] / (Fl[u]or[escent] Lamp, 17-8-[19]61) [NFRC]. 1 larva (third instar), Rennie, Life Table Plot, 21-7-1964 [21.vii.1964], [hand-written, underside of label] (P-30) [collector unknown; CNC]. 1 larva (third instar), Rennie, Life Table Plot, 4-8-1964 [4.viii.1964], [hand-written, underside of label] (P-95) [collector unknown; CNC]. 1? [abdomen damaged], Riverton, Life Table Plot, 27.viii.1963, [hand-written, underside of label] (R 39) [collector unknown; CNC]. 1?, Russell, ([F.I.S.] 645, Rec[eived] 7-6-1968) [collector unknown] / (*Acer negundo*, W68, 645) [NFRC]. 1?, Sandilands Res[erve], 28-7-1938 (L.T. White) [NFRC]. 1?, Seddon's Cor[ner], (*Larix laricina*, A #16, AC, 26-6-[19]61) [collector unknown] / (F.I.S., Em[erged] 17-7-[19]61) [cocoon pinned with specimen; NFRC]. 1?, 1? [abdomen damaged], Seddon's Cor[ner], L[ight] T[rap], 31.vii.1961 [collector unknown] [NFRC]. 1?, Seddon's Cor[ner], (F.I.S., 2-8-[19]61) [collector unknown] / (*Larix laricina*, Coll[ected], R #102, 2-8-[19]61) [NFRC]. 2♂, Seddon's Cor[ner], Light Trap, 24-8-1962 [24.viii.1962], [hand-written, underside of label] (A) [collector unknown; CNC]. 3♂, 1♀, Seddon's Cor[ner], Light Trap, 8-9-1962 [8.ix.1962], [hand-written, underside of label] (A) [collector unknown; CNC]. 1 larva (third instar), Seddon's Cor[ner], Life Table Plot, 15-7-1964 [15.vii.1964], [hand-written, underside of label] (A-6) [collector unknown; CNC]. 1 larva (third instar), Seddon's Cor[ner], Life Table Plot, 29-7-1964 [29.vii.1964], [hand-written, underside of label] (A-4) [collector unknown; CNC]. 1 larva (third instar), Seddon's Cor[ner], Life Table Plot, 29-7-1964 [29.vii.1964], [hand-written, underside of label] (A-38) [collector unknown; CNC]. 1 larva (third instar), Seddon's Cor[ner], Life Table Plot, 26-8-1964 [26.viii.1964], [hand-written, underside of label] (A-42) [collector unknown; CNC]. 1♂, Sheridan, ([F.I.S.] Inc[losure] 4712, Rec[eived] 22-8-1968) [collector unknown] / (*Picea glauca*, W68, 4712) [NFRC]. 1♂, Souris, (F.I.S. [W66] 2973, Rec[eived] 19-8-66 [1966]) / (*Populus tremuloides*, W66, 2973) / [type-written] (10) [collector unknown; CNC]. 1♀, Spruce Woods Prov[incial] Park, (Sp[ruce] bud funnel traps) [undated; collector unknown] [NFRC]. 1♀, S[pruce] W[oods] F[orest] R[eserve], (F.I.S.: W-369 I, Em[erged] 9.vii.[19]48, ex Aphids) [col-

141.Label data provided by C.A. Tauber *in litt.* 2006.

lector unknown] [NFRC]. 1♀, Telford, 26.vii.[19]61 [collector unknown; CNC]. 4♂, 2♀, 1? [abdomen damaged], Telford, L[ight] T[r]ap, 26.vii.1961 [collector unknown] [NFRC]. 3♀, Telford, L[ight] T[r]ap, 2.viii.1961 [collector unknown] [NFRC]. 1♀, Telford, Life Table Plot, 24.vii.1963, [hand-written, underside of label] (T-21) [collector unknown; CNC]. 1♀, Telford, Life Table Plot, 24.vii.1963, [hand-written, underside of label] (T-30) [collector unknown; CNC]. 1♂, Telford, Life Table Plot, 7-8-1963 [7.viii.1963], [hand-written, underside of label] (T-28) [collector unknown; CNC]. 1♂, Telford, Life Table Plot, 7-8-1963 [7.viii.1963], [hand-written, underside of label] (T-32) [collector unknown; CNC]. 1♂, Telford, Life Table Plot, 7-8-1963 [7.viii.1963], [hand-written, underside of label] (T-44) [collector unknown; CNC]. 1♂, Telford, Life Table Plot, 7-8-1963 [7.viii.1963], [hand-written, underside of label] (T-71) [collector unknown; CNC]. 1♂, Telford, Life Table Plot, 7-8-1963 [7.viii.1963], [hand-written, underside of label] (T-87) / [type-written] (1) [collector unknown; CNC]. 1♀, Telford, Life Table Plot, 7-8-1963 [7.viii.1963], [hand-written, underside of label] (T-64) [collector unknown; CNC]. 1♂, Telford, Life Table Plot, 28.viii.1963, [hand-written, underside of label] (T-20) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 8-7-1964 [8.vii.1964], [hand-written, underside of label] (T-10) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 8-7-1964 [8.vii.1964], [hand-written, underside of label] (T-16) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 8-7-1964 [8.vii.1964], [hand-written, underside of label] (T-34) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 8-7-1964 [8.vii.1964], [hand-written, underside of label] (T-36) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 8-7-1964 [8.vii.1964], [hand-written, underside of label] (T-38) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 8-7-1964 [8.vii.1964], [hand-written, underside of label] (T-48) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 8-7-1964 [8.vii.1964], [hand-written, underside of label] (T-60) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 22-7-1964 [22.vii.1964], [hand-written, underside of label] (T-6) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 22-7-1964 [22.vii.1964], [hand-written, underside of label] (T-14) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 22-7-1964 [22.vii.1964], [hand-written, underside of label] (T-16) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 22-7-1964 [22.vii.1964], [hand-written, underside of label] (T-23) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 22-7-1964 [22.vii.1964], [hand-written, underside of label] (T-24) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 22-7-1964 [22.vii.1964], [hand-written, underside of label] (T-40) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 22-7-1964 [22.vii.1964], [hand-written, underside of label] (T-46) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 22-7-1964 [22.vii.1964], [hand-written, underside of label] (T-83) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 22-7-1964 [22.vii.1964], [hand-written, underside of label] (T-100) [collector unknown; CNC]. 1♂, Telford, Life Table Plot, 5-8-1964 [5.viii.1964], [hand-written, underside of label] (T-4) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 5-8-1964 [5.viii.1964], [hand-written, underside of label] (T-7) [collector unknown; CNC]. 1♂, Telford, Life Table Plot, 5-8-1964 [5.viii.1964], [hand-written, underside of label] (T-17) [collector unknown; CNC]. 1♀, Telford, Life Table Plot, 5-8-1964 [5.viii.1964], [hand-written, underside of label] (T-16) [collector unknown; CNC]. 1♀, Telford, Life Table Plot, 5-8-1964 [5.viii.1964], [hand-written, underside of label] (T-25) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 5-8-1964 [5.viii.1964], [hand-written, underside of label] (T-42) [collector unknown; CNC]. 1 larva (third instar), Telford, Life Table Plot, 5-8-1964 [5.viii.1964], [hand-written, underside of label] (T-87) [collector unknown; CNC]. 1♀, Telford, (Egg Coll[ection] + Pred[ators] #125, 6.vii.[19]66 [collector unknown]) [cocoon pinned with specimen; NFRC]. 1♂, Winnipeg, (F.I.S.: W-, Rec[eived] 5.x.[19]45 [collector unknown], Host: Elm) [NFRC]. 1♀, Winnipeg, (F.I.S. Em[er]ged 28-8-[19]64) [collector unknown] / (Bl[ack] Knot on Chokecherry, R[ea]r[e]d, W64) / [type-written] (1) / [type-written] (66-44) [cocoon pinned with specimen; NFRC]. 1♂, 6♀, Winnipeg, 19.vii.[19]77 / (M. J. Tauber & C. A. Tauber, Collectors) [TAUBER<sup>142</sup>]. **FLIGHT PERIOD:** April 14 (1952; Brandon)–October 16 (1910; Stony Mountain). **LOCALITIES:** Agassiz F[orest] R[eserve] [Agassiz Provincial Forest, 49°59'59"N 96°09'00"W;

CNC]. Altona [49°06'17"N 97°33'32"W; CNC]. Ashville [51°10'30"N 100°17'45"W; NFRC]. Assiniboine R[iver], Treesbank [49°38'10"N 99°36'34"W; CNC]. Aweme [49°42'31"N 99°36'10"W; CNC<sup>143</sup>]. Bald Head Hills, 13 mi[les] N [of] Glenboro [Bald Head Hills, Mountain, 49°40'52"N 99°18'18"W; CNC]. Beausejour<sup>144</sup> [50°03'44"N 96°30'58"W; UMW]. Beulah [50°15'38"N 101°02'12"W; CNC]. Bissett [51°01'30"N 95°40'52"W; NFRC]. Brandon [49°50'49"N 99°57'08"W; CNC, NFRC, UMW]. Brandon, 6 mi[les] NW [Forest, 49°57'59"N 99°56'12"W; CNC]. Carberry [49°52'08"N 99°21'34"W; CNC, UMW]. Carey [49°26'34"N 97°03'03"W; CNC]. Cedar Lake / Cedar Lake, 3 mi[les] S [53°19'45"N 100°10'08"W; CNC, MCZ]. Clear L[a]k[e], Riding M[oun]t[ai]n Nat[ional] P[ar]k [50°40'32"N 100°00'00"W; CNC]. Cross L[ake] [52°19'16"N 101°27'05"W; CNC]. Falcon Lake Campground, Whiteshell Prov[incial] P[ar]k [Falcon Lake, 49°41'11"N 95°19'34"W; ROM]. Flin Flon [54°46'05"N 101°51'51"W; CNC, NFRC]. Fort Garry / F[or]t Garry [49°50'29"N 97°09'00"W; CNC, NFRC]. Gladstone [50°13'33"N 98°57'00"W; CNC]. Glenboro [49°33'21"N 99°17'28"W; NFRC]. Glenlea Research Station<sup>145</sup>, Glenlea [49°38'08"N 97°08'06"W; LEM, UMW]. Grandview [51°10'27"N 100°41'52"W; NFRC]. Husavick [Husavik, 50°33'47"N 96°59'34"W; CNC]. Ile des Chenes [Ile des Chênes, 49°42'38"N 96°59'18"W; UMW]. Kenville [52°00'01"N 101°19'25"W; CNC]. La Barriere P[ar]k [La Barrière, 49°42'47"N 97°11'22"W; UMW]. Lake Winnipeg, Grand Beach [Grand Beach, 50°33'15"N 96°38'00"W; TAUBER<sup>146</sup>]. Lyleton [49°03'28"N 101°10'40"W; CNC]. Mafeking [52°41'01"N 101°06'36"W; CNC, NFRC, USS]. Maple Leaf Prov[incial] C[a]mpg[r]ound, 6 mi[les] E [of] Portage la Prairie [Portage la Prairie, 49°58'22"N 98°17'31"W; TAUBER<sup>147</sup>]. Minitonas [52°05'10"N 101°02'21"W; NFRC]. Minnedosa, 5 mi[les] N [50°14'43"N 99°50'34"W; CNC]. Morden [49°11'31"N 98°06'02"W; CNC, UMW]. Morris [49°21'07"N 97°21'51"W; CNC]. Napinka [49°19'21"N 100°50'28"W; CNC]. Neepawa [50°13'44"N 99°27'56"W; CNC]. Ninette [49°24'00"N 99°37'43"W; CNC]. Ninga [49°13'39"N 99°53'22"W; CNC, USS]. Norgate, 5 mi[les] W, Riding M[oun]t[ai]n Nat[ional] P[ar]k [Norgate, 50°40'59"N 99°28'10"W; CNC]. Overflow [Overflowing River, 53°08'29"N 101°05'34"W; CNC]. Pilot Mound [49°12'05"N 98°53'38"W; CNC]. Pinawa [50°08'56"N 95°52'50"W; UMW]. Pine Falls [50°33'59"N 96°13'03"W; NFRC, UMW]. Pipestone [49°33'28"N 100°56'44"W; NFRC]. Portage [Portage la Prairie, 49°58'22"N 98°17'31"W; UMW]. Red Rock Lake<sup>148</sup> / R[ed] R[ock] Swamp [49°59'08"N 95°31'19"W; CNC]. Rennie / Rennie, Life Table Plot [49°51'10"N 95°33'10"W; CNC<sup>149</sup>, NFRC, UMW]. Riding M[oun]t[ai]n / R[iding] M[ountain] N[at]ional P[ar]k [Riding Mountain National Park of Canada, 50°53'N 100°15'W; CNC]. Riverton, Life Table Plot [50°59'54"N 96°59'46"W; CNC]. S[ain]te Rita, 7.3 mi[les] E [49°52'48"N 96°17'44"W; MMMN]. Sandilands, H[igh]w[a]y 1 at 506 [49°19'28"N 96°17'47"W; MMMN]. Sandilands Res[erve] [Sandilands Provincial Forest, 49°22'37"N 96°06'31"W; NFRC]. Sanford [49°40'57"N 97°26'39"W; UMW]. Sasaginnigak [Sasaginnigak Lake, 51°35'36"N 95°40'00"W; CNC]. Seddon's Cor[ner] [Seddons Corner, 50°03'43"N 96°17'27"W; CNC<sup>150</sup>, NFRC]. Selkirk [50°08'37"N 96°53'02"W; UMW]. Sheridan [Sherridon, 55°07'26"N 101°05'12"W; NFRC]. Shilo, 5 mi[les] SW [49°48'20"N 99°38'28"W; CNC]. Shortdale [51°14'06"N 101°02'10"W; UMW]. Souris [49°37'02"N 100°15'37"W; CNC]. S[pruce] W[oods] F[orest] R[eserve] [Spruce Woods Provincial Forest, 49°46'38"N 99°21'01"W; NFRC]. Spruce Woods Prov[incial] Park [Spruce Woods Provincial Park, 49°42'34"N 99°05'50"W; NFRC]. Starbuck [49°46'20"N 97°37'02"W; UMW]. Stockton, 2 mi[les] W [49°35'22"N 99°27'11"W; CNC]. Stony Mountain [50°05'11"N 97°13'08"W; CNC, MCZ]. Swan R[iver] [52°06'21"N 101°16'00"W; CNC]. Telford / Telford, Life Table Plot [49°50'25"N 95°23'08"W; CNC<sup>151</sup>,

142. Label data provided by C.A. Tauber *in litt.* 2006.

143. Includes Paratype(s) of *Chrysopa downesi* Smith.

144. Garland 1982 [1984]: 395, line 7: Beausejour, should read: Beausejour; label is correct.

145. The University of Manitoba's Glenlea Research Station is located just south of Winnipeg.

146. Label data provided by C.A. Tauber *in litt.* 2006.

147. Label data provided by C.A. Tauber *in litt.* 2006.

148. The Winnipeg Forest Entomology Laboratory's Whiteshell Field Station on Red Rock Lake MB was commenced in 1948 (Webb 1964: 18).

149. Record includes two pinned third-instar larvae.

150. Record includes four pinned third-instar larvae.

151. Record includes 19 pinned third-instar larvae.



NFRC, UMW]. The Pas [53°49'30"N 101°15'12"W; CNC]. Treesbank [49°38'10"N 99°36'34"W; CNC]. U[niversity of] M[anitoba] [Fort Garry, 49°50'29"N 97°09'00"W; LEM, UMW]. Wabowden [54°54'32"N 98°37'47"W; CNC]. Wanless [54°10'42"N 101°21'39"W; CNC]. Whitemouth [49°57'15"N 95°58'31"W; CNC]. Whitewater L[ake], 4 mi[les] N [of] Whitewater [49°14'59"N 100°18'32"W; CNC]. Winkler [49°10'54"N 97°56'25"W; CNC]. Winnipeg [49°53'04"N 97°08'47"W; CNC, LEM, MCZ, MMMN, NFRC, TAUBER<sup>152</sup>, UMW].

**NB: T = 12** (2♂, 10♀). **FIRST RECORD:** 1♂, New Denmark, Vict[oria] Co[unty], 17.vii.1942 (FIS 1942, 42-L366, *Picea glauca*) [collector unknown; MFRC]. **FLIGHT PERIOD:** June 10 (1949; Fredericton)–September 1 (1956; Jacquet Head). **LOCALITIES:** F[rederic]ton [45°56'43"N 66°40'00"W; CNC, MFRC]. Greenriver [Green River, 47°19'N 68°09'W; CNC]. Jacquet Head<sup>153</sup>, Restigouche Co[unty] [Jacquet River, 47°55'N 66°00'W; CNC]. McGraw B[rook] [46°49'N 66°07'W; NDFRC]. New Denmark, Vict[oria] Co[unty] [46°59'N 67°36'W; MFRC].

**NL: T = 4** (♀). **FIRST RECORD:** 1♀, S[ain]t John's, 14.vii.1969 [collector unknown; MU]. **FLIGHT PERIOD:** July 5 (1979; Bishop's Falls)–September 12 (1977; Avalon Peninsula). **LOCALITIES:** Avalon Pen[insula] [47°30'N 53°30'W; MU]. Bishops Falls [Bishop's Falls, 49°01'N 55°29'W; SJARS]. Lewisporte [49°15'N 55°03'W; SJARS]. S[ain]t John's [47°34'N 52°44'W; MU].

**NS: T = 8** (4♂, 4♀). **FIRST RECORD:** 2♂, 1♀, Centreville, Kings Co., 2.x.1950 (D.C. Ferguson) [NSM, USNM]. **FLIGHT PERIOD:** June 5 (1959; Aldershot)–October 4 (1950; Wellington). **LOCALITIES:** Aldershot [45°06'N 64°31'W; KARS]. Cambridge [conflicting place names; KARS]. Centreville, Kings Co[unty] [45°08'N 64°32'W; NSM, USNM]. Sable Island<sup>154</sup>, Met[eorological] Station [43°57'N 59°55'W; NSM]. Wellington<sup>155</sup> [Wellington Station<sup>156</sup>, 44°52'N 63°37'W; USNM].

**NT: T = 28** (7♂, 18♀, 3?). **FIRST RECORD:** 2♂, 1♀, Mackenzie River, 1929 (O. Bryant) [CAS]. **FLIGHT PERIOD:** May 18 (1953; Yellowknife)–August 19 (1950; Fort Simpson). **LOCALITIES:** Aklavik / Aklavik, 50 mi[les] NE [68°13'10"N 135°00'20"W; CAS, CNC]. Dempster H[igh]w[ay], km 503, 67°12'N 135°35'W [ROM]. F[or]t McPherson [67°26'20"N 134°52'50"W; CNC]. Fort Simpson / Fort Simpson, 3 mi[les] SE on E side [of the] Mackenzie River at No Name Creek [61°51'45"N 121°20'55"W; CNC]. Mackenzie River<sup>157</sup> [Aklavik, 68°13'10"N 135°00'20"W; CAS]. Norman Wells [65°16'55"N 126°49'45"W; CNC]. Yellowknife [62°27'20"N 114°21'00"W; CNC, USNM].

**NU: T = 1** (♂). **FIRST RECORD:** 1♂, Bathurst Inlet NWT, 27.vi.1951 (W.I. Campbell<sup>158</sup>) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. **FLIGHT PERIOD:** June 27 (1951; Bathurst Inlet). **LOCALITIES:** Bathurst Inlet<sup>159</sup> [66°50'20"N 108°02'55"W; CNC].

**ON: T = 191** (61♂, 122♀, 8?). **FIRST RECORD:** 1♀, Jordan, 9.vii.1914 (W.A. Ross) [USNM]. **NEW RECORDS:** 1♀, B[lack] S[turgeon] L[ake] F[orestry] S[tation], 7/9/54 [1954] (D.F.B.) / (light trap) / [type-written] (3-30) / [type-written] (U.N.B.30) / [paper rectangle with a green and yellow band at one end, not

152. Label data provided by C.A. Tauber *in litt.* 2006.

153. Garland 1982 [1984]: 406, line 6: Jaquet Head, should read: Jacquet Head; label is correct.

154. Sable Island is an isolated, treeless, twenty mile strip of sand over 100 miles SE of Cape Canso, covered only with coarse grasses, Juniper, Beach Pea and other seashore plants (Ferguson 1954); more precisely, it is located 150 miles [240 km] east of NS in the Atlantic Ocean (Howden 1970).

155. Record in Garland 1982 [1984]: 406: NS: 1♂, Wellington, 4.x.1950 (D.C. Ferguson) [USNM].

156. Wellington Station, Halifax County: Ferguson (1954: Corrigenda to Part 1, The Lepidoptera of Nova Scotia), wrote: "It should have been mentioned in the introduction that the accompanying map of Nova Scotia was specially prepared to show the geographical location of the collecting sites, many of which are situated near small rural communities not indicated on most maps of the province. The underlined place names denote localities referred to in the text." Wellington Station is an underlined locality on Ferguson's map; in the text, he referred to it simply as Wellington.

157. Mackenzie River: Owen Bryant, the collector, lived and collected a few miles west of Aklavik at the base of the Richardson Mountains (W.J. Brown 1956: 51).

158. Record in Garland 1982 [1984]: 378, line 10: W.L. Campbell, should read: W.I. Campbell.

159. Bathurst Inlet is north of tree-line (Scudder 1979).



inscribed] / (paper disc, yellow) / [hand-written] (2230) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC]. 1♀, Ottawa, em[erged] 18.ix.1962 (J.F. McAlpine) / (On *Pemphigus* infested *Populus deltoides*) [cocoon, pupal exuvium and leaf with aphids pinned with specimen; CNC]. 1♂, Red Lake Road, Sioux Lookout, (F.I.S., Em[erged] 18.viii.1958) / (Coll[ected] 17.vii [1958] [collector unknown], T-64, ex *Cinara banksiana*) [cocoon pinned with specimen; NFRC]. **FLIGHT PERIOD:** April 10 (1952; Bells Corners)–November 10 (1966; Toronto). **LOCALITIES:** Agawa Bay [47°21'N 84°38'W; UG]. Amethyst [Amethyst Bay, 48°33'N 88°55'W; UG]. Ancaster [43°13'N 79°59'W; CNC]. Attawapiskat, 52°N [52°56'N 82°24'W; ROM]. Batchawana [Batchawana Bay Provincial Park, 46°56'30"N 84°33'30"W; LEM]. Beardmore [49°36'N 87°57'W; NFRC]. Belleville [44°14'N 77°21'W; UG; RARS]. Bell's Corners [Bells Corners, 45°19'N 75°50'W; CNC]. Biscotasing [47°17'N 82°06'W; CNC]. B[la]ck Sturgeon L[a]k[e] / B[la]ck S[turgeon] L[ake] F[orestry] S[tation] / Black Sturg[eon] Lake<sup>160</sup> (49°20'N 88°53'W; CNC, ZMUH). Brighton [44°06'N 77°46'W; CNC]. Carp [45°21'N 76°02'W; CNC]. Cawaja Beach, Tiny T[ownshi]p, Simcoe Co[unty] [44°42'N 80°01'W; ROM]. Cedar Lake [Cedar Lake, Algonquin Park, 46°01'N 78°28'W; CNC]. Chaffey's Locks [44°35'N 76°19'W; ROM, UG]. Chatham [42°24'N 82°11'W; CNC, UWO]. Clinton [43°37'N 81°32'W; UG]. Cooksville [43°34'N 79°37'W; ROM]. Crystal Lake [conflicting place names; UMW]. Dunn T[ownshi]p [Dunn, 42°53'N 79°38'W; UWO]. E[l]mira [43°36'N 80°33'W; UG]. Eramosa [43°37'N 80°13'W; UG]. F[or]t Frances<sup>161</sup> [48°36'N 93°24'W; CNC]. Foxboro [44°15'N 77°26'W; UG]. Georgian Bay Island 421 [Georgian Bay Islands National Park of Canada, 44°53'N 79°52'W; UG]. Goderich, Maitland R[iver] at H[igh]w[a]y 21 [43°45'N 81°43'W; ROM]. Gogama [47°40'N 81°43'W; GLFRC]. Guelph [43°33'N 80°15'W; UG]. Hamilton [43°14'N 79°57'W; MCMU, UWO]. Harrow [42°02'N 82°55'W; MCMU, UG]. Hawk L[ake] [49°48'N 93°59'W; NFRC]. Huntla [49°06'N 81°16'W; GLFRC]. Ignace [49°25'N 91°41'W; CNC]. Island Falls [49°35'N 81°23'W; CNC]. Iron Bridge [46°17'N 83°14'W; CNC]. Iroquois [44°51'N 75°19'W; ROM]. Jordan [43°09'N 79°23'W; CNC, USNM]. Kendal [44°02'N 78°32'W; ROM]. Kenora / Kenora, 5–10 mi[les] N [49°49'N 94°26'W; CNC, UMW]. Kingsville [42°06'N 82°44'W; CNC]. Lambeth [42°54'N 81°18'W; UWO]. Leaside [43°42'N 79°22'W; UG]. London [42°59'N 81°14'W; LEM, UG]. Longlac [49°48'N 86°31'W; GLFRC]. Magpie [48°06'N 84°42'W; CNC]. Malachi [49°56'N 94°59'W; CNC]. Manitoulin [45°45'N 82°30'W; UG]. Marathon [48°45'N 86°26'W; GLFRC]. Marmora [44°29'N 77°41'W; CNC]. Mattice [49°37'N 83°16'W; GLFRC]. Merivale [45°19'N 75°43'W; CNC]. Niagara [43°00'N 79°15'W; UG]. Nipigon [49°00'N 88°20'W; LEM]. Ogoki [51°38'N 85°57'W; CNC]. One Sided Lake, Larsson's [Claxton Township, Rainy River District]<sup>162</sup>, 49°03'N 93°54'W; ROM]. Orono [43°59'N 78°37'W; ROM]. Ospringe [43°42'N 80°07'W; UG]. Ottawa / East Ottawa / Ottawa, Eastview [45°16'N 75°45'W; CNC]. Paris [43°12'N 80°23'W; UG]. Pelee Is[land] [41°45'N 82°41'W; ROM]. Petawawa Res[earch Forest] [Chalk River]<sup>163</sup>, 46°01'N 77°27'W; UWO]. Peterboro [44°18'N 78°19'W; UG]. P[oin]t Pelee [Point Pelee National Park of Canada, 49°58'N 82°31'W; CNC]. Port Credit [43°33'N 79°35'W; ROM]. Red Lake [51°04'N 93°44'W; GLFRC]. Red Lake Road, Sioux Lookout [Sioux Lookout, 50°04'N 91°59'W; NFRC]. Ryland [49°43'N 83°47'W; GLFRC]. S[ain]t Davids [43°10'N 79°07'W; UG]. Sauble Falls Prov[incial] P[ar]k, 3.5 km E [44°40'15"N 81°15'30"W; ROM]. Sault S[ain]te Marie [46°31'N 84°20'W; CNC]. Sioux Lookout [50°04'N 91°59'W; CNC]. Southampton [44°29'N 81°23'W; CNC]. S[outh] Neebing T[ownshi]p [Neebing, 48°10'N 89°25'W; ROM]. Spanish [46°12'N 82°21'W; UG]. Stoney Creek [43°13'N 79°46'W; UG]. Sudbury [46°31'N 80°54'W; ROM]. Tashoto [Tashota, 40°14'N 87°40'W; CNC]. Thessalon [46°15'N 83°34'W; LEM, UG]. Thunder Bay [48°24'N 89°19'W; UG]. Tillsonburg [42°51'N 80°44'W; CNC]. Timmins [48°28'N 81°20'W; CNC]. Toronto [43°42'N 79°25'W; GLFRC, ROM, UG]. Unaka [49°42'N 91°06'W; CNC]. Vermilion Bay [49°51'19"N 93°24'07"W;

160. Black Sturgeon Lake, Thunder Bay District: Rockburne and Lafontaine 1976: 9.

161. Garland 1982 [1984]: 400, line 2: 'F[or]t Francis' should read 'F[or]t Frances'.

162. J.E.H. Martin, personal communication [1980].

163. Petawawa Forest Experiment Station (now Petawawa Research Forest), located in the northern 100 km<sup>2</sup> of the Petawawa Military Reserve near Chalk River ON; Headquarters on the shore of Corry Lake, about 3–4 miles from Chalk River (Place 2002: 5).

CNC]. Whitby [43°53'N 78°56'W; UG]. Woodstock [43°08'N 80°45'W; UG].

**QC: T = 84** (31♂, 50♀, 3?). **FIRST RECORD:** 1 ?, Laniel, 18.vii.1931 (H.S. Fleming) [CNC]. **NEW RECORDS:** 1 ♂, Beechgrove, 45°39'N 76°08'W, 29.vi.1962 (J.R. Vockeroth) [cocoon pinned with specimen; CNC]. **FLIGHT PERIOD:** April 10 (1951; Farnham)–October 28 ([1957]<sup>164</sup>; Montreal). **LOCALITIES:** Beechgrove, 45°39'N 76°08'W [Beech Grove; CNC]. Berthier [46°05'18"N 73°12'44"W; UdeM]. Berthierville [46°05'N 73°11'W; UdeM]. Canton Bousquet, C[om]té R[ouyn]-Noranda [48°10'N 78°30'W; CSQ]. Canton Descombes [sic], C[om]té Abitibi-Est [De Combles, Baie-James, 40°06'N 76°59'W; CSQ]. Canton Duparquet, C[om]té Abitibi-O[uest] [48°30'N 79°10'W; CSQ]. Canton Duquesne, C[om]té Rimouski [48°15'N 68°30'W; CSQ]. Canton Fournière, C[om]té R[ouyn]-Noranda [48°05'N 78°05' W; CSQ]. Canton Fox, C[om]té Bonaventure [49°00'N 64°25'W; CSQ]. Canton Low, C[om]té Gatineau [45°50'N 76°05'W; CSQ]. Canton Plessis, C[om]té Chicoutimi [48°15'N 71°30'W; CSQ]. Canton Preissac, C[om]té R[ouyn]-Noranda [48°20'N 78°20'W; CSQ]. Canton Saguenay, C[om]té Charlevoix [48°05'N 69°50'W; CSQ]. Cap Chat [Cap-Chat, 49°06'N 66°41'W; CNC]. Cap-Rouge [46°45'05"N 71°20'40"W; UL]. Choisy, n[ea]r Rigaud [45°28'58"N 74°12'53"W; ZMUH]. Farnham [45°17'N 72°59'W; UdeM]. Harrington L[ake], Gatineau P[ar]k [Harrington, Lac, 45°51'41"N 74°33'19"W; CNC]. Hudson Heights [45°27'51"N 74°09'05"W; ZMUH]. Kirks Ferry [Kirk's Ferry, 45°32'30"N 75°49'00"W; CNC]. Lac Brulé, C[om]té Labelle [Lac-Brûlé, 46°05'N 74°17'W; CSQ]. Lac des Pins, C[om]té Labelle [Lac-des-Pins, 45°55'28"N 74°29'54"W; CSQ]. Lac Mondor, S[ain]te Flore [Lac-Mondor, Sainte-Flore, 46°37'32"N 72°45'52"W; CNC]. Lac Serpent, Notre Dame du Laus [Lac-Serpent, Notre-Dame-du-Laus, 46°09'N 75°30'W; LEM]. Lacolle [45°05'N 73°22'W; LCCU]. Laniel [47°03'N 79°16'W; CNC, UAE]. Lanoraie [45°58'N 73°13'W; UdeM]. Laval [45°35'N 73°45'W; LEM]. Mac[donald] College [Sainte-Anne-de-Bellevue, 45°24'N 73°56'W; LEM]. Montreal [Montréal, 45°31'N 73°39'W; LEM, UdeM]. M[on]t S[ain]t Hilaire [Saint-Hilaire, 45°33'30"N 73°11'54"W; LEM]. Nominigüe [46°24'N 75°02'W; UdeM]. Padoue, C[an]ton Cabot, C[om]té Matapédia [48°35'N 67°59'W; CSQ]. Parc du Mont Tremblant [Mont-Tremblant, Parc national du, 46°26'N 74°21'W; UdeM]. Pépinière Berthier, C[om]té Berthier [Berthier, 46°05'18"N 73°12'44"W; CSQ]. Pointe des Cascades [Pointe-des-Cascades, 45°20'N 73°58'W; LEM]. Portage du Lac Brochet, C[om]té Roberval [Roberval, 48°31'N 72°14'W; CSQ]. Région de Authier, C[om]té Abitibi-O[uest] [Authier, 48°44'N 78°51'W; CSQ]. Région Forestville, C[om]té Saguenay [Forestville, 48°44'N 69°05'W; CSQ]. Région Val-d'Or, C[om]té Abitibi-E[st] [Val-d'Or, 48°06'N 77°47'W; CSQ]. Rivière-à-Pierre, C[om]té Portneuf [46°59'N 72°11'W; CSQ]. Rougemont [45°26'N 73°03'W; CNC]. S[ain]te Anne de Bellevue [Sainte-Anne-de-Bellevue, 45°24'N 73°56'W; LEM]. S[ain]te Clotilde [Sainte-Clotilde-de-Châteauguay, 45°09'29"N 73°40'42"W; SJRS]. Senneterre, C[om]té Abitibi-E[st] [Canton Senneterre, 48°20'N 77°15'W; CSQ]. Villedonne, C[om]té Gatineau [Canton Villedonné, Comté Pontiac, 47°22'N 77°07'W; CSQ]. York [48°45'N 64°32'W; LEM].

**SK: T = 242** (73♂, 158♀, 11?) + 2 larvae. **FIRST RECORD:** 1♂, Delmas, vii.1912 (Claude Morley) [BMNH]. **NEW RECORDS:** 1♀, Creelman, (F.I.S. 3206, Rec[eived] 26-8-66 [1966; collector unknown]) / (*Pinus banksiana*, W66, 3206) / [type-written] (3) [CNC]. 1♀, Creighton<sup>165</sup>, (F.I.S., 993-03, Rec[eived] 19-6-[19]67) [collector unknown]) / (Jack Pine, W67-993-03) [NFRC]. 1♀, Cypress Hills, ([F.I.S.] Inc[losure] W67, 4501, Em[erged] 11-9-[1967]) [collector unknown] / (*Pinus banksiana*, W67-4501) [NFRC]. 1♂, Estevan, (F.I.S., 3836, Rec[eived] 19-9-66) [1966; collector unknown] / (*Fraxinus pennsylvanica*, W66, 3836) [NFRC]. 1♀, Estevan, (F.I.S. 3836, Rec[eived] 19-9-66 [1966; collector unknown]) / (*Fraxinus pennsylvanica*, W66, 3836) / [type-written] (24) [CNC]. 1♀, Estevan, (F.I.S. 3849, Rec[eived] 19-9-66 [1966; collector unknown]) / (*Ulmus americana*, W66, 3849) / [type-written] (22) [CNC]. 1♂, Estevan, (F.I.S. 3871, Rec[eived] 19-9-66 [1966; collector unknown]) / (*Acer negundo*, W66, 3871) / [type-written] (23) [CNC]. 1♀, Fort a la Corne Prov[incial] For[est], ([F.I.S.] Inc[losure] 4348, Rec[eived] 15-8-1968) [collector unknown] / (*Picea glauca*, W68, 4348) [NFRC]. 2♀, Francis, (F.I.S., 3773, Rec[eived] 14-9-66) [1966; col-

164. Garland 1982 [1984]: 405, line 2: 28.X, should read: 28.X.1957; collected by G.A. Moore [LEM].

165. The label reads Creighton Man[itoba]; however, Creighton is located in Saskatchewan, just west of Flin Flon MB. A label correcting this error has been pinned with the specimen.

lector unknown] / (*Ulmus americana*, W66, 3773) [NFRC]. 1♀, Francis, (F.I.S. 3773, Rec[eived] 14-9-66 [1966; collector unknown]) / (*Ulmus americana*, W66, 3773) / [type-written] (20) [CNC]. 1♀, Francis, (F.I.S. 3773, Rec[eived] 14-9-66 [1966; collector unknown]) / (*Ulmus americana*, W66, 3773) / [type-written] (21) [CNC]. 1♂, Francis, (F.I.S. 3774, Rec[eived] 14-9-66 [1966; collector unknown]) / (*Salix* sp., W66, 3774) / [type-written] (13) [CNC]. 1♂, Francis, (F.I.S. 3776, Rec[eived] 14-9-66 [1966; collector unknown]) / (*Fraxinus pennsylvanica*, W66, 3776) / [type-written] (18) [CNC]. 1♀, Francis, (F.I.S. 3776, Rec[eived] 14-9-66 [1966; collector unknown]) / (*Fraxinus pennsylvanica*, W66, 3776) / [type-written] (19) [CNC]. 1♂, Francis, (F.I.S., 3777, Rec[eived] 14-9-66) [1966; collector unknown] / (*Acer negundo*, W66, 3777) [NFRC]. 1♀, Francis, (F.I.S. 3777, Rec[eived] 14-9-66 [1966; collector unknown]) / (*Acer negundo*, W66, 3777) / [type-written] (14) [CNC]. 1♂, Goodeve, (F.I.S. 3446, Rec[eived] 31-8-66 [1966; collector unknown]) / (*Populus tremuloides*, W66, 3446) / [type-written] (4) [CNC]. 1♂, Greenwater [Lake], on white spruce, 18.iv.1984 (R. Hooper) [SMNH]. 1♀, Grenfell, (F.I.S. 3854, Rec[eived] 19-9-66 [1966; collector unknown]) / (*Ulmus americana*, W66, 3854) / [type-written] (7) [CNC]. 1♀, Grenfell, (F.I.S. 3861, Rec[eived] 19-9-66 [1966; collector unknown]) / (*Acer negundo*, W66, 3861) / [type-written] (8) [CNC]. 3♀, Indian Head, 2.vii.1954 [collector unknown] / (from *Cinara palmerae* (Gill.), *Picea glauca*) [NFRC]. 1♂, Indian Head, (F.I.S. 3558, Rec[eived] 6-9-66 [1966; collector unknown]) / (*Populus* sp., W66, 3558) / [type-written] (15) [CNC]. 1♀, Indian Head, (F.I.S. 3558, Rec[eived] 6-9-66 [1966; collector unknown]) / (*Populus* sp., W66, 3558) / [type-written] (16) [CNC]. 1♂, Indian Head, (F.I.S. 3637, Rec[eived] 6-9-66 [1966; collector unknown]) / (*Acer negundo*, W66, 3861) / [type-written] (17) [CNC]. 1♂, Kelvington, ([F.I.S.], Inc[losure] W68, 1592, Rec[eived] 21-6-[1968] [collector unknown]) / (*Caragana*, W68, 1592) [NFRC]. 1♀, Marieval, (F.I.S., Inc[losure] 3579, Rec[eived] 21-8-[19]67 [collector unknown]) / (Chokecherry, W67, 3579) / (*Chrysopa carnea* Steph., [Det] J.E.M.) [NFRC]. 1? [abdomen damaged], Marieval Reg[ional] Park, (F.I.S., Inc[losure] 3584, Rec[eived] 21-8-[19]67 [collector unknown]) / (Green Ash, W67, 3584) [NFRC]. 1♀, Minestik [*sic*] Beach, ([F.I.S.] Inc[losure] 2715, Rec[eived] 15-7-1968 [collector unknown]) / (Alder, W68, 2715) [NFRC]. 1♀, Otter Lake, ([F.I.S.] Inc[losure] 1245, Rec[eived] 17-6-1968 [collector unknown]) / (*Salix* sp., W68, 1245) [NFRC]. 1♀, Oungre, (F.I.S. 3783, Rec[eived] 15-9-66 [1966; collector unknown]) / (*Acer negundo*, W66, 3783) / [type-written] (28) [CNC]. 1♀, Parview [*sic*], ([F.I.S.] Inc[losure] 967, Rec[eived] 13-6-1968 [collector unknown]) / (*Picea glauca*, W68, 967) [NFRC]. 1♂, Regina, [-].x.1988 (A. Nalewany) [SMNH]. 1♂, Smeaton, ([F.I.S.] Inc[losure] 4599, Rec[eived] 20-8-1968 [collector unknown]) / (*Picea mariana*, W68, 4599 [NFRC]. 1♀, Stony Rapids, 30.vi.1975 (R. Hooper) [SMNH]. 1? [abdomen missing], Torch River, (F.I.S.: W-0262A, Rec[eived] 7.viii.[19]44 [collector unknown], Host: W[hite] Spruce) [cocoon pinned with specimen; NFRC]. 1♀, Wadena, [-].vi.1972 (R. Hooper) [SMNH]. 1♂, Wolseley, ([F.I.S.] 54-124, 17.ix.1954 [collector unknown]) / (from *Cinara hottesi* (G & P), *Picea glauca*) [NFRC]. 3♂, 3♀, 1? [abdomen damaged], Wolseley, ([F.I.S.] 54-124, 17.ix.1954 [collector unknown]) / (from *Cinara hottesi* (G & P), *Picea glauca*) / (*Chrysopa ploribunda* var. *californica* Coq.) [NFRC]. 2♂, 7♀, Yorkton, 15.ix.1959 (J.R. Vockeroth) [CNC]. **FLIGHT PERIOD:** April 10 (1925; Indian Head)-November 16 (1919; Saskatoon). **LOCALITIES:** Amisk Lake [54°35'N 102°15'W; CNC]. Ardill [49°56'N 105°51'W; RARS]. Avonlea [50°01'N 105°04'W; RARS, SMNH]. Beupre [Beupré Lake, 54°32'N 107°10'W; CNC]. Big River [53°50'N 107°01'W; CNC]. Canora [51°38'N 102°26'W; CNC]. Creelman [49°49'N 103°18'W; CNC]. Creighton [54°45'N 101°54'W; NFRC]. Crest[wynd] [50°06'N 105°41'W; UMW]. Cut Knife [52°45'N 109°01'W; CNC]. Cypress Hills [Cypress Hills, Mountain in SK, 49°40'N 109°30'W; NFRC, SMNH]. Debden [53°31'N 106°53'W; CNC]. Delmas [52°56'N 108°36'W; BMNH]. Dilke [50°52'N 105°15'W; RARS]. Dunblane [51°11'N 106°52'W; CNC]. Edenwold [50°38'N 104°15'W; RARS]. Estevan [49°08'N 102°59'W; CNC, NFRC]. Findlater [50°47'N 105°24'W; RARS]. F[or]t a la Corne [Fort-à-la-Corne<sup>166</sup>, 53°09'N 104°47'W; CNC]. Fort a la Corne Prov[incial] For[est] [Fort-à-la-

166. Fort à la Corne: "The Hudson's Bay Company's Fort à la Corne stood on a fine river-flat on the Saskatchewan River, east of the Indian Reserve and north of Kinistino." (Morton 1937: 136). More recently, a Post Office SW of Nipawin. Gazetteer of Canada (Saskatchewan), 2<sup>nd</sup> Ed. 1969.



Corne Provincial Forest, 53°17'N 104°43'W; NFRC]. Fort Qu'Appelle [50°46'N 103°48'W; CNC]. Francis [50°06'N 103°52'W; CNC, NFRC]. Goodeve [51°04'N 103°11'W; CNC, NFRC]. Great Deer [52°35'N 107°03'W; CNC]. Greenwater [Lake] [52°32'N 103°30'W; SMNH]. Grenfell [50°25'N 102°56'W; CNC]. Hudson Bay [52°51'N 102°23'W; CNC]. Indian Head [50°32'N 103°40'W; CNC, IHTN, NFRC, UMW]. Jameson [50°24'N 104°17'W; RARS]. Kamsack [51°34'N 101°54'W; SMNH]. Kelvington [52°10'N 103°32'W; NFRC]. Kenosee [Kenosee Lake, 49°50'N 102°17'W; CNC]. Kronau [50°18'N 104°18'W; RARS]. Lac la Ronge [La Ronge, 55°06'N 105°17'W; CNC]. Lanigan [51°51'N 105°02'W; RARS]. Lebret [50°45'N 103°42'W; CNC]. Loon L[ake] [54°02'N 109°10'W; CNC]. Marieval [50°35'N 102°39'W; NFRC]. Marieval Reg[ional] Park [Marieval, 50°35'N 102°39'W; NFRC]. Meacham [52°06'N 105°45'W; RARS]. Minestik Beach [Ministik Beach, 51°38'N 101°37'W; NFRC]. Mozart [51°47'N 104°00'W; CNC]. Nisbet P[rovincial] F[orest] [53°14'N 105°45'W; NFRC]. Otter Lake [conflicting place names; NFRC]. Oungre [49°09'N 103°48'W; CNC]. Ox Bow [Oxbow, 49°14'N 102°10'W; CNC]. Parview [Parkview, 50°37'N 105°27'W; NFRC]. Pelican Narrows [55°10'N 102°56'W; SMNH]. Prince Albert [53°12'N 105°46'W; CNC]. Punichy [51°23'N 104°18'W; SMNH]. Qu'Appelle Valley [Qu'Appelle River, 50°29'N 101°29'W; RARS]. Regina [50°27'N 104°37'W; RARS, SEM, SMNH]. Roche Percee [49°04'N 102°48'W; SMNH]. Rockglen [49°11'N 105°57'W; CNC, USS]. S[ain]t Gregor [52°11'N 104°50'W; SARS<sup>167</sup>]. Saskatoon [52°07'N 106°38'W; CNC<sup>168</sup>, USNM, USS]. Smeaton [53°30'N 104°49'W; NFRC]. Stony Rapids [59°15'35"N 105°50'W; SMNH]. Torch River [53°37'N 104°09'W; NFRC]. Val Marie [49°14'N 107°44'W; SMNH]. Wadena [51°57'N 103°48'W; SMNH]. Waterhen [Waterhen Lake, 54°31'N 108°25'W; NFRC]. White City [50°26'N 104°22'W; RARS]. Whitefox [White Fox, 53°27'N 104°05'W; CNC]. Wolseley [50°25'N 103°16'W; NFRC]. Yorkton [51°13'N 102°28'W; CNC].

**YK: T = 100** (56♂, 44♀) + 1 larva. **FIRST RECORD:** 1♂, Haines J[un]ct[ion], 2.viii.1948 (Mason & Hughes) / [paper rectangle with a green and orange band at one end] / [paper disc, yellow<sup>169</sup>] / [type-written] (2805) / (*Chrysopa carnea* Steph., Det. P. Adams) [CNC<sup>170</sup>]. **NEW RECORDS:** 1♂, Dawson, 14 mi[les] E, 1300 ft [396 m], 29.vii.1962 (R.E. Leech) / [paper rectangle with a green and orange band at one end, inscribed] (♂, *Anisochrysa* sp.n.) / [hand-written] (*Chrysoperla* n[ea]r *carnea* but differs; no apical lip on 9S[ternum]; acumen long, wing setae very long.<sup>171</sup>) [genitalia in microvial pinned with specimen; CNC]. 1♀, Dawson, 14 mi[les] E, 1300 ft [396 m], 29.vii.1962 (R.E. Leech) / [paper rectangle with a green and orange blotch at one end, inscribed] (♀ *Anisochrysa* sp.n., Det. P. Adams 1974) / [hand-written] (This is odd *carnea*) [CNC]. 1♀, Dawson, 14 mi[les] E, 1300 ft [396 m], 30.vii.1962 (P.J. Skitsko) [CNC]. 2♂, Dawson, 14 mi[les] E, 1300 ft [396 m], 31.vii.1962 (P.J. Skitsko) [CNC]. 1♀, Dawson, 14 mi[les] E, 1300 ft [396 m], 1.viii.1962 (P.J. Skitsko) [CNC]. 1♀, Moose Creek, 14 km NW [of] Stewart Cross[ing], stream Willow thicket, malaise-FIT<sup>172</sup>, 18.vi–30.viii.[19]84 (S. & J. Peck) [CNC]. **FLIGHT PERIOD:** April 15 (1979; Klondike Highway, Pelly Crossing, 466 km, campground)–August 28 (1959; Whitehorse). **LOCALITIES:** Dawson / Dawson, 14 mi[les] E, 1300 ft [396 m] [64°03'45"N 139°25'50"W; CNC, SEM]. Dempster H[igh]w[a]y, Eagle R[iver] / Dempster H[igh]w[a]y, Eagle R[iver], 379 km, 66°27'N 136°45'W / Dempster H[igh]w[a]y, Eagle R[iver], 379 km, 66°25'N 136°41'W / Dempster H[igh]w[a]y, Eagle R[iver], 420 km, 66°35'N 136°18'W [ROM, SEM]. Dempster H[igh]w[a]y, Ogilvie R[iver], 198 km, 65°52'N 138°19'W [ROM]. Haines J[un]ct[ion] [60°45'10"N 137°30'25"W; CNC]. Klondike H[igh]w[a]y, mi[le] 30 [CAS]. Klondike H[igh]w[a]y, Pelly X-ing [Crossing], 466 km, campground, 62°49'N 136°35'W [ROM]. Klondike H[igh]w[a]y, 1 km E [of] junction [with] Dempster H[igh]w[a]y at Flat Cr[ee]k, 63°57'N 138°37'W [ROM]. Klondike H[igh]w[a]y, Von Wilczek L[ake], 450

167.Record consists of two third-instar larvae (Garland 1982 [1984]: 394).

168.Includes Paratype(s) of *Chrysopa downesi* Smith.

169.Paper discs pinned with many specimens apparently signify gender, yellow for ♀ and green for ♂; whoever placed these labels made a mistake here because both specimens are ♂.

170.Includes a second ♂, same data except for the type-written label, which reads: (2806).

171.This label, unsigned, may have been placed by Dr. P.A. Adams.

172.FIT = Flight Intercept Trap.



km, 62°41'N 136°43'W [ROM<sup>173</sup>]. Kluane [Kluane National Park and Reserve of Canada, 60°45'N 139°30'W; SEM]. Mayo [63°35'35"N 135°53'45"W; SEM]. Moose Creek, 14 km NW [of] Stewart Cross[ing] [Moose Creek, River, 63°30'N 137°01'W; CNC]. Rampart House [67°25'N 140°59'W; CNC]. Whitehorse [60°43'N 135°03'W; CNC]. Willow Cr[ee]k, km 621, Klondike H[igh]w[a]y [Willow Creek, River, 62°49'55"N 136°37'10"W; SEM].

#### UNITED STATES:

**AK: T = 83** (8♂, 18♀, 57?). **FIRST RECORD:** 2♀, Fairbanks, 2.vii.1921 (J.M. Aldrich) [USNM]. **NEW RECORDS:** 1♂, Fairbanks, 13.viii.[19]72 (J.P. Kramer) [TAUBER<sup>174</sup>]. 1♂, 1♀, Goldstream Valley, 9 mi[les] NW [of] Fairbanks, 8.v.[19]76 (R.W. Philip, Collector) / (M.J. & C.A. Tauber Lot 76:15) [TAUBER<sup>175</sup>]. 55? [males and females], Goldstream Valley, 9 mi[les] NW [of] Fairbanks / (lab-reared [1976], M.J. & C.A. Tauber Lot 76:12) [TAUBER<sup>176</sup>]. **FLIGHT PERIOD:** May 8 (1976; Goldstream Valley, 9 miles NW of Fairbanks)–August 13 (1972; Fairbanks). **LOCALITIES:** Big Delta [64°10'N 145°55'W; CNC]. Chitina [61°30'N 144°31'W; USNM]. Circle [65°50'N 144°05'W; USNM]. College [64°54'N 147°55'W; CU]. Eklutna [61°25'N 149°27'W; USNM]. Fairbanks [64°50'N 147°50'W; CNC, NSM, TAUBER, USNM]. Goldstream Valley, 9 mi[les] NW [of] Fairbanks [Fairbanks, 64°50'N 147°50'W; TAUBER]. Lower Tonsina [Tonsina, 61°35'N 145°14'W; USNM]. Nenana [64°35'N 149°20'W; USNM]. Palmer [61°35'N 149°10'W; USNM]. Richard[son] H[igh]w[a]y, mile 315 [CNC]. Shaw Cr[ee]k, Rich[ardson] H[igh]w[a]y, m[ile] 289 [CNC].

*Chrysoperla carnea* s.l. has been found in all provinces and territories of Canada, except Prince Edward Island; and in Alaska. Canadian localities in literature for which no specimen has been seen, are: Agassiz BC (Smith 1932, as *Chrysopa plorabunda*), Creston BC (Smith 1932, as *C. plorabunda*; Wilde 1962, as *C. carnea*), Rock Creek BC (Smith 1932, as *C. downesi*), Grimsby ON (Putman 1932b, as *C. plorabunda*), and Vineland / Vineland Station ON (Putman 1932a, 1932b, 1937, 1963; Garlick 1955; Putman and Herne 1960; as *C. plorabunda*). Alaskan localities in literature for which no specimen has been seen, are: Fort Yukon (Bickley and MacLeod 1956, as *Chrysopa harrisii*; Throne 1971, as *C. harrisii*; Bickley and MacLeod 1956, as *C. plorabunda*), and Kotzebue (Bickley and MacLeod 1956, as *C. plorabunda*). All specimens reported here are documented with data in Garland (1982, 2000), or as new records (above). Based on label data, adults have been taken at light, light trap, Malaise trap / Malaise flight intercept trap, or by sweeping along a power-line cut, beside a tundra pond, along a dry roadside field, along a stream and Willow thicket, on debris, in a forest, and swept from or associated with *Abies balsamea*, *Abies grandis*, *Acer negundo*, *Acer rubrum*, Alder, Alfalfa, Apple, *Artemesia* [sic] *absinthium*, Aspen, Aspen Poplar (cut the previous year), *Atriplex hortensis*, Balsam [Fir], *Betula papyrifera*, Birch, B[lack] Spruce / Black Spruce, Brome Grass, Caragana, Carrot (wild), *Cirsium arvense/arvensis* [sic], Chokecherry black knot, *Convolvulus*, *Convolvulus sepium*, Currant trees, D[ouglas] Fir, Elm, *Epilobium* (flowers), ‘epinette noire’ [Black Spruce], *Euphorbia esula*, Fir (Spruce-Fir), *Fraxinus pennsylvanica*, Garry Oak, Gooseberry, Green Ash, Hemlock, *Hordeum jubatum*, Indian Paint Brush, J[ack] Pine / Jack Pine, Juniper, Larch/*Larix laricina*, L[odge] P[ole] Pine, *Malus*, *Matricaria maritima*, Oak, *Oenothera biennis*, ‘orme’ [Elm], *Picea*, *Picea glauca*, *Picea mariana*, *Picea pungens*<sup>177</sup>, Pine (forest), *Pinus banksiana*, *Polygonum*, *Polygonum coccineum*, *Populus*, *Populus deltoides*, *Populus tremuloides*, Potato, *P[seudotsuga] taxifolia*<sup>178</sup>, *Quercus macocarpa* [sic], *Quercus macrocarpa*, Red Clover (as Baker Red Clover), Rose, *Rumex*, *Rumex crispus*, *Rumex stenophyllus*, *Salix*, *Solidago*, *Solidago canadensis*, *Sonchus arvensis*, Spirea, Spruce / Spruce-Aspen (forest), Sunflower, Sweet Clover, *Ulmus americana*, *Verbascum thaspus*, Vetch, White Pine, W[hite] Poplar, W[hite] Spruce / Wh[ite] Spruce / White Spruce, Willow, and

173. Record consists of one third-instar larva (Garland 1982 [1984]: 414).

174. Label data provided by C.A. Tauber *in litt.* 2006.

175. Label data provided by C.A. Tauber *in litt.* 2006.

176. Label data provided by C.A. Tauber *in litt.* 2006.

177. *Picea pungens*, Colorado Spruce: frequently planted for ornamental purposes in Canada; also used for wind-breaks (Farrar 1995).

178. *Pseudotsuga taxifolia*, now known as *Pseudotsuga menziesii* var. *menziesii*.

Wild Rose; and during winter months under bark (in dry wood) of Douglas Fir and *Pinus ponderosa*. One adult was recorded as predatory on *Pristiphora erichsonii* (Hartig) [Hymenoptera], others on *Cinara banksiana* Pepper & Tissot, *C. hottesi* (Gillette & Palmer), and *C. palmerae* Gillette [*Cinara pruinosa* Hartig] [Hymenoptera]; two larvae on *Phyllotreta cruciferae* (adults). Also from label data, adults have been reared from galls [Dunn Tp.; UWO], from *Platysamia cecropia* [*Hyalophora cecropia*; probably an empty cocoon], from larvae from a bud-moth spin-up, from a larva preying on *Pemphigus* sp., and from larvae or cocoons found on: **ABIES**: Canton Bousquet, C[om]té R[ouyn]-Noranda QC [FIS, 1940-9282-C, as ‘sapin’; cocoon pinned with specimen; CSQ]. Canton Fournière, C[om]té R[ouyn]-Noranda QC [FIS, [19]41-10891-C, as ‘sapin’; cocoon pinned with specimen; CSQ]. **LARIX LARICINA**: Pine Falls MB [FIS P.F.13; UMW]. **LARIX OCCIDENTALIS**: Box Lake BC [FIS 1943, BC-3931B; CNC]. Edgewood BC [FIS 1942, BC-3403H; CNC]. Sugar Lake BC [FIS 1943, BC-4043E, as *Larix occid.*]. **PICEA**: Canton Preissac, C[om]té R[ouyn]-Noranda QC [FIS, 1940-9825-E, as ‘epinette’; cocoon pinned with specimen; CSQ]. Eholt BC [FIS 1950, BC-50-1206; CNC]. Jasper National Park, Pocahontas District AB [FIS 1944, BC-44-268; CNC]. Kootenay National Park BC [FIS 1941, BC-2390; FIS 1944, BC-44-588; CNC]. Kootenay Nat[ional] Park BC, betw[een] Kays & [and] McLeod M[ea]d[o]ws [F.I.Survey 1944, BC 44-588; CNC]. Lac des Pins, C[om]té Labelle QC [FIS, 1940-9544-F, as ‘epinette’; cocoon pinned with specimen; CSQ]. Lake Minnewanka AB [FIS 1944, BC-44-599C; CNC]. Mount Revelstoke National Park BC [FIS 1941, BC-2138A; CNC]. Noble Creek BC [FIS 1944, BC-44-431F; CNC]. Saunders AB, 12 mi[les] W [FIS 1940, BC-1613A; CNC]. Trinity Valley BC [1937 (K. Graham), cocoon on Spruce; CNC]. Yoho National Park, Ottertail BC [FIS 1943, BC-4016B; CNC]. **PICEA ENGELMANNII**: Barrière BC [FIS 1939, BC-887, as *Picea engelmanni* [sic]; CNC]. Pioneer Mine BC [FIS 1940, BC-1657, as *Picea engelmanni* [sic]; CNC]. Trinity Valley BC [FIS 1941, BC-2383, as *Picea engelmanni* [sic]; CNC]. **PICEA GLAUCA**: Beardmore ON [FIS 1941, 132E, as White Spruce; NFRC]. Canton Fournière, C[om]té R[ouyn]-Noranda QC [FIS, 1940-9822-B, as ‘epinette blanche’; cocoon pinned with specimen; CSQ]. Hunta ON [FIS, 560-7216-14; GLFRC]. Lac Brulé, C[om]té Labelle QC [FIS, 1942-17446-D, as ‘epinette blanche’; cocoon pinned with specimen; CSQ]. Longlac ON [FIS, 560-3420-04; FIS, 560-7477-03; GLFRC]. Mattice ON [FIS, 560-5681-06; GLFRC]. Ryland ON [FIS, 560-7461-11; GLFRC]. Seebe AB [FIS 1940, BC-1556B; CNC]. Waterhen SK [FIS, W-956, as W[hite] Spruce; NFRC]. **PICEA MARIANA**: F[or]t à la Corne SK [FIS, W-63-3672; CNC]. Gogama ON [FIS, 560-5122-04; GLFRC]. Marathon ON [FIS, 560-7494-03; GLFRC]. Red Lake ON [FIS, 560-7585-04; GLFRC]. **PINUS CONTORTA** var. *latifolia*: Cranbrook BC [FIS 1941, BC-2481B, as *Pinus contorta latif.*; CNC]. Huscroft BC [FIS 1941, BC-2306B; CNC]. Jasper National Park, Pocahontas area AB [FIS 1943, BC-4087; CNC]. Lemon Creek BC [FIS 1942, BC-3384; CNC]. Renata BC [FIS 1942, BC-3449A; CNC]. Seebe AB [FIS 1942, BC-3426A; CNC]. **PINUS BANKSIANA**: Hawk L[ake] ON [FIS 1941, as Jack Pine; CNC]. **PINUS MONTICOLA**: Kuskanax Creek BC [FIS 1943, BC-4065B; CNC]. **PINUS PONDEROSA**: Cranbrook BC [FIS 1941, BC-2519; CNC]. Deep Creek, Peachland BC [FIS 1945, BC-45-161A; CNC]. Kettle Valley BC [FIS 1942, BC-3466; CNC]. Princeton BC, near [FIS 1941, BC-2275B; CNC]. **POPULUS DELTOIDES**: Ottawa ON [CNC]. **PRUNUS VIRGINIANA**: Riding Mountain National Park MB [FIS, W-63-3 43-03, as Chokecherry; CNC]. **PSEUDOTSUGA MENZIESII** var. *MENZIESII*: Cherryville BC [FIS 1943, BC-3911C, as *Pseudotsuga taxifolia*; CNC]. Deer Park BC [FIS 1945, BC-45-267; CNC]. Duncan BC [FIS 1942, BC-3427A, as *Pseudotsuga taxifolia*; CNC]. Pioneer Mine BC [FIS 1940, BC-1653H, as *Pseudotsuga taxifolia*; CNC]. Powell Lake BC [FIS 1942, BC-3229, as *Pseudotsuga taxifolia*; CNC]. Princeton BC [FIS 1941, BC-2188A, as *Pseudotsuga taxifolia*; CNC]. Ross Creek BC [FIS, BC-58-5000-01, as *Pseudotsuga taxifolia*; CNC]. Seebe AB [FIS 1940, BC-1554, as *Pseudotsuga taxifolia*; CNC]. Williams Lake BC, 5 miles N [FIS 1944, BC-44-177A, as Douglas Fir; CNC]. **SALIX**: Reno AB [FIS 61-A-602-04; CNC]. **THUJA PLICATA**: Upper Arrow Forest, Trout Lake BC [FIS 1943, BC-3997; CNC]. **TSUGA HETEROPHYLLA**: Sechelt BC, Indian Reserve [FIS 1942, BC-3304B; CNC]. Cocoons pinned with specimens are yellowish white. Larvae from Rennie, Seddon’s Cor[ner], and Telford MB [CNC] were collected on Life Table Plots.<sup>179</sup> This species was reported as active throughout the winter at Vancouver, British Columbia (Fos-

ter 1942, as *Chrysopa harrisii*). Bionomic notes on this species in literature pertaining to Canada have been summarised (Garland 1985a). Biology and immature stages of this species have been studied in California (Toschi 1965, as *Chrysopa carnea*). Also, seasonal adaptations and life history traits have been studied in populations from diverse areas of North America, including Manitoba and Alaska (C.A. Tauber and Tauber 1982, as *Chrysopa carnea*).

### **CHRYSOPERLA HARRISII (Fitch, 1855)**

*Chrysopa harrisii* Fitch, 1855: 794; 1856: 90. Type: USA: New York [State]; monotypy; male, MCZ (Penny *et al.* 1997). *Chrysoperla harrisii* (Fitch, 1855): Garland 1984: 93.

### **SYNONYMY PERTAINING TO CANADA**

*Chrysopa downesi*: Putman 1932b: 121–126; Smith 1932: 584 (part: footnote 4).

*Chrysopa ?downesi*: Putman 1937: 29–37.

*Chrysopa harrisii*: Smith 1932: 595–596 (part: ON, not BC); Judd 1949: 461–464; Garlick 1955: 282, 326, 328; Throne 1971: 73; Tauber 1974: 1148–1149; M.J. Tauber and Tauber 1974: 969.

*Chrysoperla harrisii*: Garland 1982 [1984]: 206–210, 374–376, 417, Figs. 83–86, 98, Map 17; 1984: 93; 1985a: 737–751, 755, 1278 (erratum); Penny *et al.* 1997: 52 (part: ON, not BC).

**CANADA: T = 248** (118♂, 120♀, 10?) + 1 larva. **FIRST RECORD:** ON: 1♂, C[entral] E[xperimental] F[arm], from pine, emerg[ed] 16.viii.1911 [collector unknown; CNC]. **NEW RECORDS:** (Province unknown): 1♂, em[erged] 3.viii.1937 (F.I.Survey 1937, Record No. 1155A) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [type-written] (2586) / (*Chrysopa harrisii* Fitch, Det. P. Adams) [cocoon pinned with specimen; CNC]. 1♀, em[erged] 3.viii.1937 (F.I.Survey 1937, Record No. 1155A) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / [type-written] (2573) / (*Chrysopa harrisii* Fitch, Det. P. Adams) [cocoon pinned with specimen; CNC]. 1♀, em[erged] 3.viii.1937 (F.I.Survey 1937, Record No. 1155A) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, yellow] / [type-written] (2584) / (*Chrysopa harrisii* Fitch, Det. P. Adams) [cocoon pinned with specimen; CNC]. 1♂, em[erged] 4.viii.1937 (F.I.Survey 1937, Record No. 1155A) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [type-written] (2579) / (*Chrysopa harrisii* Fitch, Det. P. Adams) [cocoon pinned with specimen; CNC]. 1♀, em[erged] 4.viii.1937 (F.I.Survey 1937, Record No. 1155A) [collector unknown] / [type-written] (48) / [hand-written] (54-23) / [paper rectangle with a green and orange band at one end, inscribed by hand] (3066) / [paper disc, yellow] / (*Chrysopa harrisii* Fitch, Det. P. Adams) [cocoon pinned with specimen; CNC]. 1♂, em[erged] 5.viii.1937 (F.I.Survey 1937, Record No. 1155A) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [type-written] (2576) / (*Chrysopa harrisii* Fitch, Det. P. Adams) [cocoon pinned with specimen; CNC]. 1♂, em[erged] 5.viii.1937 (F.I.Survey 1937, Record No. 1155A) [collector unknown] / (*Chrysopa harrisii* Fitch, WCM<sup>180</sup>) / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [paper disc, bluish-green] / [type-written] (2587) / (*Chrysopa harrisii* Fitch, Det. P. Adams) [cocoon pinned with specimen; CNC]. 1♀, em[erged] 5.viii.1937 (F.I.Survey 1937, Record No. 1155A) [collector unknown] / (*Chrysopa harrisii* Fitch, W.C.M.) [cocoon pinned with specimen; NFRC]. 1? [abdomen missing], em[erged] 7.viii.1937

179. Life Table Plots were operated as part of a long-term project on the population dynamics of the larch sawfly, *Pristiphora erichsonii* (Hartig) by the Forest Entomology Laboratory, Winnipeg MB (Webb 1964: 21). In 1964, one of us (JAG), while working as a Technical Officer with the Canada Department of Forestry at the Whiteshell Field Station on Red Rock Lake MB, supervised the preservation of these very larvae.

180. WCM : W.C. McGuffin.



(F.I.Survey 1937, Record No. 1155A) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end, not inscribed] / [type-written] (2575) / (*Chrysopa harrisii* Fitch, Det. P. Adams) [CNC]. 1♀, em[erged] 13.ix.1937 (F.I.Survey 1937, Record No. 2015) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end] / [paper disc, yellow] / [type-written] (2583) / (*Chrysopa harrisii* Fitch, Det. P. Adams) [cocoon pinned with specimen; CNC]. 1♂, em[erged] 24.viii.1938 (F.I.Survey 1938, Record No. 5290B) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end] / [paper disc, bluish-green] / [type-written] (2588) / (*Chrysopa harrisii* Fitch, Det. P. Adams) [cocoon pinned with specimen; CNC]. 1? [abdomen missing], em[erged] 17.viii.1939 (F.I.Survey 1939, Record No. 8552B) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end] / [paper disc, bluish-green] / [type-written] (2585) / (*Chrysopa harrisii* Fitch, Det. P. Adams) [cocoon pinned with specimen; CNC]. 1♂, em[erged] 17.viii.1939 (F.I.Survey 1939, Record No. 8552B) [collector unknown] / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end] / [paper disc, bluish-green] / [type-written] (2580) / (*Chrysopa harrisii* Fitch, Det. P. Adams) [cocoon pinned with specimen; CNC]. 1? [abdomen missing], em[erged] 12.ix.1939 (F.I.Survey 1939, Record No. 8552B) [collector unknown] / (*Chrysopa harrisii* Fitch, WCM<sup>181</sup>) / [hand-written] (Ottawa) / [paper rectangle with a green and yellow band at one end] / [type-written] (2582) / (*Chrysopa harrisii* Fitch, Det. P. Adams) [cocoon pinned with specimen; CNC]. **FLIGHT PERIOD:** May 18 (1974; Dunnville ON)–October 1 (1976; Saint Lawrence Islands National Park, Thwartway Island ON).

**MB: T = 1** (♂). **FIRST RECORD:** 1♂, Fort Garry, Host: Jack Pine, em[erged] 6.viii.[19]47 (FIS, W-368) [collector unknown] / [type-written] (59) / [hand-written] (54-23) / [paper disc, bluish-green] / [paper rectangle with a green and orange band at one end, inscribed by hand] (3065) / (*Chrysopa harrisii* Fitch, Det. P. Adams) [cocoon pinned with specimen; CNC]. **FLIGHT PERIOD:** [unknown]. **LOCALITIES:** Fort Garry<sup>182</sup> [49°50'29"N 97°09'00"W; CNC].

**NS: T = 8** (4♂, 4♀). **FIRST RECORD:** 1♂, Sable Island, Main Station, 21.vii.1976 (Barry Wright) [NSM]. **FLIGHT PERIOD:** July 21 (1976; Sable Island)–August 11–14 (1978; Sable Island). **LOCALITIES:** Sable Island<sup>183</sup>, Main Station / Sable Island, Met[eorological] Station [43°57'N 59°55'W; CNC, NSM].

**ON: T = 182** (88♂, 87♀, 7?) + 1 larva. **FIRST RECORD:** 1♂, C[entral] E[xperimental] F[arm], from pine, emerg[ed] 16.viii.[19]11 [collector unknown] / (*Chrysopa harrisii* Fitch, Det. P. Adams '61) [cocoon pinned with specimen; CNC]. **NEW RECORDS:** 1♂, Breslau, Waterloo County / 18052H30, 124a1, 20.vii.[19]30 / Host: European Pine Shoot Moth, *Rhyaciona* [sic] *buoliana* (Schiff.) [collector unknown; CNC]. 1♀, Breslau, Waterloo County / 18052H30, 124a1, 20.vii.[19]30 / Host: European Pine Shoot Moth, *Rhyaciona* [sic] *buoliana* (Schiff.) [collector unknown; CNC]. 1♀, Breslau, 1930 (A.R. Graham) / 18052H30, 124a1, 20.vii.[19]30 / Host: European Pine Shoot Moth, *Rhyaciona* [sic] *buoliana* (Schiff.) [CNC]. 1♂, Cent[ral] Exp[erimental] Farm, Ottawa, vi.1967 (J.F. McAlpine) / Reared from *Pineus similis* on *Picea glauca*, em[erged] 7–9.vii.1967 [CNC]. 1♀, Eldyne, W[hite] Spruce, em[erged] 29.viii.1942 (FIS 1942, Rec[ord] 7177D) [collector unknown] / [a separate hand-written label] (Ottawa) / [type-written] (2574) / (*Chrysopa harrisii* Fitch, Det. P. Adams) / (Adams Slide No. 6-III-67.2) [cocoon pinned with specimen; CNC]. 3♂, 3♀, Golden L[ake], 18.viii.1965 (J.E.H. Martin) [reared; cocoons on individual pine needles pinned with specimens; CNC]. 2♂, 1♀, 1? [abdomen missing], Hamilton / 18082H30, 109a 7, 20.vii.[19]30 / Host: European Pine Shoot Moth, *Rhyaciona* [sic] *buoliana* (Schiff.) [collector unknown; reared; cocoons on individual pine needles pinned with specimens; CNC]. 6♂, 5♀, Maynooth, 18.viii.1965 (J.E.H. Martin) [reared; cocoons on individual pine needles

181.WCM : W.C. McGuffin.

182.Fort Garry: a Forest Insect Laboratory opened in June 1940 on the campus of the University of Manitoba, Fort Garry, Winnipeg; it was abandoned in January 1961 (Webb 1963).

183.Sable Island is an isolated, treeless, twenty mile strip of sand over 100 miles SE of Cape Canso, covered only with coarse grasses, Juniper, Beach Pea and other seashore plants (Ferguson 1954); more precisely, it is located 150 miles [240 km] east of NS in the Atlantic Ocean (Howden 1970).



pinned with specimens; CNC]. 1♂, 2♀, S[ain]t Lawrence Is[lands] Nat[ional] Park, Thwartway Is[land] / Code 4484-N, 22.viii.1976 (Reid) [CNC]. 1♂, S[ain]t Lawrence Is[lands] Nat[ional] Park, Thwartway Is[land] / Code 4800-R, 1.x.1976 (R.A. Turner) [CNC]. **FLIGHT PERIOD:** May 18 (1974; Dunnville)–October 1 (1976; Saint Lawrence Islands National Park, Thwartway Island). **LOCALITIES:** Agincourt [43°47'N 79°17'W; UG]. Ballentrae [Ballantrae, 44°02'N 79°18'W; CNC]. Baxter [44°15'N 79°50'W; LEM]. Biscotasing [47°17'N 82°06'W; CNC]. Breslau / Breslau, Waterloo County [43°28'N 80°25'W; CNC]. Cent[ral] Exp[erimental] Farm, Ottawa / C[entral] E[xperimental] F[arm] [Ottawa, 45°16'N 75°45'W; CNC]. Chalk River [46°01'N 77°27'W; LEM]. Chatham [42°24'N 82°11'W; UWO]. Dunnville [42°54'N 79°37'W; UG]. Eldyne<sup>184</sup> [Cloyne, 44°49'N 77°11'W; CNC]. F[or]t Frances [48°36'N 93°24'W; CNC]. Go Home Bay [44°59'N 79°56'W; CNC]. Golden L[ake] [45°35'N 77°14'W; CNC]. Grimsby [43°12'N 79°34'W; UG]. Guelph [43°33'N 80°15'W; UG]. Hamilton [43°14'N 79°57'W; CNC, MCMU]. Madawaska [45°30'N 77°59'W; CNC]. Maynooth [45°14'N 77°57'W; CNC]. Meaford [44°36'N 80°44'W; UG]. Pontypool [44°06'N 78°38'W; CNC]. Port Credit [43°33'N 79°35'W; ROM]. S[ain]t Davids [43°10'N 79°07'W; UG]. S[ain]t Lawrence Is[lands] Nat[ional] Park, Thwartway Is[land]<sup>185</sup>, Code 4484-N / S[ain]t Lawrence Is[lands] Nat[ional] Park, Thwartway Is[land], Code 4800-R [Leek Island, 44°18'N 76°09'W; CNC]. Sauble Beach [44°38'N 81°16'W; GLFRC]. Sault S[ain]t[e] Marie [46°31'N 84°20'W; GLFRC]. Toronto [43°42'N 79°25'W; ROM]. Whitby [43°53'N 78°56'W; UG].

**QC: T = 43** (19♂, 24♀). **FIRST RECORD:** 1♀, Berthierville, 7.vii.1930 (L. Daviault) [CSQ]. **FLIGHT PERIOD:** 4 June (1976; Ste-Anne-de-Bellevue)–7 September (1948; Berthierville). **LOCALITIES:** Berthierville [46°05'N 73°11'W; UdeM]. S[ain]te Anne de Bellevue / Morgan Arboretum [Sainte-Anne-de-Bellevue, 45°24'11"N 73°56'58"W; LEM].

*Chrysoperla harrisii* occurs in Canada, mainly Ontario and Quebec. Manitoba is the western-most province from which this species has been authenticated in Canada (Garland 1985a, and above); in the United States, the only reliable western records are from Minnesota (Parfin 1952) and Wisconsin (Throne 1971). Sable Island NS is the only authenticated locality in Atlantic Canada. Canadian localities in literature for which no specimen has been seen, are: Comox and Victoria BC (Smith 1932, as *Chrysopa harrisii*; also cited by Spencer 1942, as *C. harrisii*; cited as BC by M.J. Tauber and Tauber 1974, as *C. harrisii*; cited as BC by Penny *et al.* 1997, as *Chrysoperla harrisii*)<sup>186</sup>, and Niagara ON (Putman 1932b, as *Chrysopa downesi*; Smith 1932, as *C. downesi*; Putman 1937, as *C. ?downesi*). Alaskan localities in literature for which no specimen has been seen, are: Fort Yukon AK (Bickley and MacLeod 1956, as *Chrysopa harrisii*)<sup>187</sup>. All specimens reported here are documented with data in Garland (1982 [1984]), or as new records (above). Based on label data, adults have been taken at light and associated with Fir, Pine (Red Pine, White Pine), and *Robinia* trees; also, they have been reared from larvae or cocoons found on *Picea glauca*, Pine, Jack Pine, and Red Pine / *Pinus resinosa*, and from larvae feeding on the European Pine Shoot Moth *Rhyacionia buoliana* (Denis and Schiffmüller), and the Spruce Gall Adelgid *Pineus similis* (Gillette). Cocoons are yellowish-brown; those from Golden Lake ON and Maynooth ON were fastened by silk to the adaxial surface of pine needles pinned with the specimens. Bionomic notes on this species in literature pertaining to Canada have been summarised (Garland 1985a).

### **CHRYSOPELRA RUFILABRIS (Burmeister, 1839)**

*Chrysopa rufilabris* Burmeister, 1839: 979. Syntypes: sex unknown; USA, and MEXICO; depository = Hamburg, destroyed [WWII] (Brooks 1994; Penny *et al.* 1997). No neotype designated.

184. Eldyne: there is no such place; treated here as a transcription error for Cloyne ON.

185. Thwartway Island, also known as Leek Island, is the southernmost of the Admiralty Islands in the Saint Lawrence River. Available from: <http://www.cruising.ca/thousand/docs/th-leek.html> (October, 2006)

186. Specimens from Comox BC and Victoria BC are examples of *Chrysoperla carnea* (Garland 1982 [1984]).

187. Record in Bickley and MacLeod (1956: 193): AK: Fort Yukon, vii.1951 (R.I. Sailer); this specimen could not be located (W.E. Bickley, *in litt.* 22.xii.1980).

## SYNONYMY PERTAINING TO CANADA

*Chrysopa rufilabris*: Gibson 1913: 137; 1915: 149; Putman 1932a: 44–45; 1932b: 121–126; Ross 1932: 40–43; Smith 1932: 597; Ross and Putman 1934: 37; Putman 1937: 29–37; Garlick 1955: 281–282, 326–328; Putman 1955: 24; Bickley and MacLeod 1956: 194; Putman 1956: 520; Putman and Herne 1958: 668, 670–671; 1960: 200; Dustan 1961: 224; Putman 1963a: 37; Herne and Putman 1966: 937, 939; Putman and Herne 1966: 811–812; Throne 1971: 74; Tauber 1974: 1149–1150; New 1975: 129; Hydorn and Whitcomb 1979: 293.

*Chrysoperla rufilabris*: Garland 1982 [1984]: 200–205, 373–374, 417, Figs. 79–82, 98, Map 16; 1984: 93; 1985a: 737–751; 756–757; Brooks 1994: 172–173, Fig. 277; Penny *et al.* 1997: 52–53.

**CANADA: T = 41** (17♂, 21♀, 3?). **FIRST RECORD**: ON: 1♀, Toronto, 14.vii.1914 (E.M. Walker) [ROM]. **FLIGHT PERIOD**: June 9 (1965; Rondeau Provincial Park ON)–September 16 (1931; Biscotasing ON).

**MB: T = 1** (?). **FIRST RECORD**: 1? [abdomen with terminalia missing], Oak Lake, (W67-2554, Rec[eived] 28.vii [1967]) / (Bur Oak, W67-2554) [NFRC]. **NEW RECORDS**: 1? [abdomen with terminalia missing], Oak Lake, (W67-2554, Rec[eived] 28.vii [1967] [collector unknown]) / (Bur Oak, W67-2554) [NFRC]. **FLIGHT PERIOD**: July 28 (1967; Oak Lake). **LOCALITIES**: Oak Lake [49°45'59"N 100°37'41"W; NFRC].

**NS: T = 2** (♂). **FIRST RECORD**: 1♂, Sable Island, Main Station, 22.vii.1976 (B. Wright) [NSM]. **FLIGHT PERIOD**: July 22 (1976; Sable Island)–August 11–14 (1978; Sable Island). **LOCALITIES**: Sable Island<sup>188</sup>, Main Station / Sable Island, Meteorological Station [43°57'N 59°55'W; NSM].

**ON: T = 35** (13♂, 20♀, 2?). **FIRST RECORD**: 1♀, Toronto, 14.vii.1914 (E.M. Walker) / (*Chrysopa rufilabris* Burm., Det. P. Adams '61) [ROM]. **NEW RECORDS**: 1♂, 1♀, Hamilton / 18082H30, 109a 7, 20.vii.[19]30 / Host: European Pine Shoot Moth, *Rhyaciona* [sic] *buoliana* (Schiff.) [collector unknown; CNC]. **FLIGHT PERIOD**: June 9 (1965; Rondeau Provincial Park)–September 16 (1931; Biscotasing). **LOCALITIES**: Biscotasing [47°17'N 82°06'W; CNC]. Chatham [42°24'N 82°11'W; UWO]. Guelph [43°33'N 80°15'W; UG]. Hamilton [43°14'N 79°57'W; CNC]. Harrow [42°02'N 82°55'W; MCMU, UG]. Lake Opeongo, Algonquin Park [45°42'N 78°23'W; MCMU]. Ottawa [45°16'N 75°45'W; CNC]. Point Pelee / Point Pelee National Park of Canada [41°58'N 82°31'W; CNC, LEM]. Port Credit [43°33'N 79°35'W; ROM]. Rondeau Provincial Park, Kent County [42°17'N 81°52'W; ROM]. Saint Davids [43°10'N 79°07'W; UG]. Southampton<sup>189</sup> [44°29'N 81°23'W; CNC]. Toronto [43°42'N 79°25'W; MCZ, ROM]. Vineland [43°09'N 79°24'W; CNC].

**QC: T = 3** (2♂, 1♀). **FIRST RECORD**: 1♂<sup>190</sup>, Laval, 1.ix.1967 (M.O. Guibord) [LEM]. **FLIGHT PERIOD**: September 1 (1967; Laval)–September 8 (1978; Ste-Anne-de-Bellevue). **LOCALITIES**: Laval [45°35'N 73°45'W; LEM]. Ste-Anne-de-Bellevue [45°24'11"N 73°56'58"W; LEM].

*Chrysoperla rufilabris* occurs in Canada, mainly Ontario and Quebec. A literature report of New Brunswick in Penny *et al.* (1997), was based on an error for “New Brunswick, New Jersey” in Banks (1903: 152); Banks (*op. cit.*) did not report any Canadian localities for this species. Sable Island NS is the only authenticated locality in Atlantic Canada. Canadian localities in literature for which no specimen has been seen, are: Grimsby ON and Niagara ON (Putman 1932b), and there are no voucher specimens for any of the biological studies in the Niagara Peninsula (Ross 1932; Ross and Putman 1934; Putman 1955, 1956; Putman and Herne 1958; Putman 1963a; Putman and Herne 1966). All specimens reported here are documented with data in Garland (1982 [1984]), or as new records (above). Based on label data, adults have been taken at light, and associated with Bur Oak, *Robinia* and White Pine trees. Also from label data, adults have been reared from larvae

188. Sable Island is an isolated, treeless, twenty mile strip of sand over 100 miles SE of Cape Canso, covered only with coarse grasses, Juniper, Beach Pea and other seashore plants (Ferguson 1954); more precisely, it is located 150 miles [240 km] east of NS in the Atlantic Ocean (Howden 1970).

189. Record in Garland (1982 [1984]: 374) should read: Southampton: 1♂, 5.ix.1939, G.S. Walley [CNC]; the gender, which was omitted, is here provided based on reexamination of specimen and label data.

190. Record in Garland (1982 [1984]: 374) should read: Laval: 1♂, 1.ix.1967, M.O. Guibord [LEM]; the gender, which was omitted, is here provided courtesy of H. Varady-Szabo *in litt.* 2005.

feeding on the European Pine Shoot Moth, *Rhyacionia buoliana* (Denis and Schiffermüller). Bionomic notes on this species in literature pertaining to Canada have been summarised (Garland 1985a). In Michigan, this insect has recently been evaluated for control of the balsam twig aphid, *Mindarus abietinus* Koch, both in laboratory and field studies in Christmas Tree (*Abies balsamea* and *A. fraseri*) plantations (Fondren *et al.* 2004).

### GENUS *CHRYSOPODES* Navás, 1913

*Chrysopodes* Navás, 1913: 329. Type species: *Chrysopodes canadasi* Navás, 1913; monotypy.

*Chrysopodes* is a New World genus with about 40 described species and many undescribed species in two subgenera, *Chrysopodes* and *Neosuarius* (Brooks and Barnard 1990; Tauber 2003). Larvae of both subgenera are trash-carriers (Monserrat *et al.* 2001).

### SUBGENUS *Chrysopodes* (*Neosuarius*) Adams and Penny, 1987

*Chrysopodes* (*Neosuarius*) Adams and Penny, 1987: 435. Type species: *Chrysopa collaris* Schneider, 1851; original designation.

The subgenus includes 11 described species distributed throughout the Neotropics, adults are pollen-feeders, and females have a slightly extended subgenitale (Brooks and Barnard 1990). There is one species in Canada, as follows:

### *CHRYSOPODES* (*NEOSUARIUS*) *PLACITA* (Banks, 1908)

*Chrysopa placita* Banks, 1908: 259. Syntypes: two males; USA: Colorado (Golden: Clear Creek and Chimney Gulch); original designation; MCZ [examined]. No lectotype designated.

*Chrysopodes* (*Neosuarius*) *placita* (Banks, 1908): Tauber 2003: 484–486.

### SYNONYMY PERTAINING TO CANADA

*Ceraeochrysa placida* [sic]: Garland 1984: 93.

*Ceraeochrysa placita*: Garland 1985a: 737–751, 1278; 1985b: 137–138; 1985c: 149; Penny *et al.* 1997: 48; Tauber *et al.* 1998: 608; 2000: 1215–1217.

*Chrysopa* species near *rufilabris*: Smith 1932: 599.

*Chrysopa intacta*: Navás 1912: 199–200; Smith 1932: 598; Bickley and MacLeod 1956: 196.

*Chrysopa placita*: Bickley and MacLeod 1956: 196.

*Chrysopodes* (*Neosuarius*) *placita*: Tauber 2003: 484–486.

*Oviedus placitus*: Garland 1982 [1984]: 253–256, 409, Figs. 74, 113–117, Map 21.

**CANADA: T = 3** (1♂, 2♀). **FIRST RECORD:** QC: 1♂, 1♀, Kazabazua, 16.viii.1927 (G.S. Walley) [CNC].

**FLIGHT PERIOD:** August 7 (1968; Chatterton ON)–August 16 (1927; Kazabazua QC).

**ON: T = 1** (♀). **FIRST RECORD:** 1♀, Chatterton, 7.viii.1968 (R.H. Parry) [UG]. **FLIGHT PERIOD:** August 7 (1968; Chatterton). **LOCALITIES:** Chatterton [44°15'N 77°29'W; UG].

**QC: T = 2** (1♂, 1♀). **FIRST RECORD:** 1♂, 1♀, Kazabazua, 16.viii.1927 (G.S. Walley) [CNC]. **FLIGHT PERIOD:** August 16 (1927; Kazabazua). **LOCALITIES:** Kazabazua [45°57'N 76°01'W; CNC<sup>191</sup>].

*Chrysopodes placita* occurs in Canada, in Ontario and Quebec. No specimen has yet been seen from British Columbia, but this species could be anticipated there, as noted by Garland (1985a); it has been reported from the western USA (Penny *et al.* 1997; Tauber *et al.* 1998), including Oregon and Utah (Garland 1985a: 749). A previous report from British Columbia (Bickley and MacLeod 1956, as *Chrysopa placita*) is attributed to confusion of Golden BC with the type locality, Golden, Colorado (Banks 1908). Canadian localities

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191. Includes Neotype (♂), *Chrysopa intacta* Navás, CNC No. 21287; cf. Garland 1985b.

reported in literature for which no specimen has been seen, are: Toronto ON (Navás 1912, as *Chrysopa intacta*; Smith 1932, as *Chrysopa intacta*; Bickley and MacLeod 1956, as *Chrysopa intacta*). All specimens reported here are documented with data in Garland (1982 [1984]). Larvae of this species overwinter as second instars (Tauber *et al.* 1998), and have the typical trash-carrying body form (Monserrat *et al.* 2001); for distinguishing traits, see Tauber *et al.* (1998). The adult female has a small lobe ventral to the subgenitale, interpreted here as a praegenitale (Garland 1982 [1984]; 1985a): this lobe has a single, asymmetric seta, which is sufficiently robust to function during copulation possibly by engaging the serrated tip of the everted male gonapsis.

## GENUS *DICHOCHRYSA* Yang, 1991

*Dichochrysa* Yang, 1991: 150 [*Nom. nov.* for *Navasius* Yang and Yang, 1990]. Type species: *Navasius eumorphus* Yang and Yang, 1990; original designation (Dong *et al.* 2004).

*Dichochrysa* includes more than 130 species and may be worldwide in distribution, with representatives in the Palaearctic, Oriental, African [Ethiopian], and Nearctic regions (Adams & Garland 1983, as *Mallada*; Dong *et al.* 2004). The genus displays retention of full genitalic components (Brooks 1997). Larvae are debris-carriers and overwinter as third instars (Séméria 1977, as *Mallada*; Adams and Garland 1983, as *Mallada*; Brooks and Barnard 1990, as *Mallada*; Tauber *et al.* 1998, as *Pseudomallada*; Monserrat *et al.* 2001, as *Pseudomallada*). The genus is represented by four species in North America (Adams and Garland 1983, as *Mallada*; Penny *et al.* 1997, as *Pseudomallada*); two of them occur in Canada, as follows:

### *DICHOCHRYSA MACLEODI* (Adams and Garland, 1983)

*Mallada macleodi* Adams and Garland, 1983: 240–244. Type: male; USA: Texas (Erath County, Stephenville); original designation; MCZ No. 32576.

*Dichochrysa macleodi* (Adams and Garland, 1983): Aspöck *et al.* 2001: Taxonomic Serial No. 666307.

*Mallada slossonae* Garland, 1996: 721. **NOM. NUD., SYN. NOV.**

#### SYNONYMY PERTAINING TO CANADA

*Mallada macleodi*: Adams and Garland 1983: 240–244; Garland 1984: 94; Garland 1985a: 737–751.

*Mallada slossonae*: Garland 1982 [1984]: 261–263, 409, Figs. 123–127, Map 23.

*Pseudomallada macleodi*: Penny *et al.* 1997: 56–57.

**CANADA: T = 4** (1♂, 3♀). **FIRST RECORD:** ON: 1♀, White Lake, uvl [ultra-violet light], 4.viii.1966 (P.D. Hebert) [ROM]. **FLIGHT PERIOD:** July 3 (1977; The Pinery Provincial Park ON)–August 4 (1966; White Lake ON).

**ON: T = 4** (1♂, 3♀). **FIRST RECORD:** 1♀, White Lake, uvl [ultra-violet light], 4.viii.1966 (P.D. Hebert) [ROM, in fluid]. **FLIGHT PERIOD:** July 3 (1977; The Pinery Provincial Park)–August 4 (1966; White Lake). **LOCALITIES:** Kendal [44°02'N 78°32'W; ROM<sup>192</sup>]. Pinery Prov[incial] P[ar]k, Lambton Co[unty], Ausable R[iver] n[ear] riverside campground, sweeping understory shrubs [The Pinery Provincial Park, 43°15'15"N 81°50'00"W; ROM<sup>193</sup>]. White Lake [White Lake, Renfrew County<sup>194</sup>, 45°21'35"N 76°29'49"W; ROM<sup>195</sup>].

*Dichochrysa macleodi* occurs in Canada, in southern Ontario. No specimen has yet been seen from Quebec, but this species could be anticipated there, as noted by Garland (1985a). All Canadian localities reported in literature have been authenticated. All specimens reported here are documented with data in Garland (1982 [1984]), and by Adams and Garland (1983). Based on label data, adults have been taken at light, and caught by sweeping understory shrubs. Larvae of this species have long been known as debris-carriers and overwin-

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192. Paratypes (2♀) of *Mallada macleodi* (Adams and Garland 1983: 242).

193. Paratype (1♂) of *Mallada macleodi* (Adams and Garland 1983: 242).

194. White Lake ON: Renfrew Co., confirmed by Dr. P.D. Hebert, 23/iii/2006 (e-mail).

195. Paratype (1♀) of *Mallada macleodi* (Adams and Garland 1983: 242).



tering (Smith 1922, as *Chrysopa cockerelli*). Although the binomen *Mallada slossonae* Garland, 1982 [1984], is not available for purposes of zoological nomenclature, it was published in 1996 as a **nomen nudum** in *Nomina Insecta Nearctica* (Poole and Gentili 1996, 2: 730). This name also appears on the website for the same publication<sup>196</sup>, and is a potential source of confusion. Therefore, *Mallada slossonae* Garland, 1996, is hereby designated as a new objective synonym under *Dichochrysa macleodi* (Adams and Garland, 1983; *Mallada*) **Syn. nov.**

### **DICHOCHRYSA PERFECTA (Banks, 1895)**

*Chrysopa perfecta* Banks, 1895b: 516–517. Type: female; MEXICO: Baja California (El Taste); monotypy; MCZ No. 11914 (Adams and Garland 1983).

*Dichochrysa perfectus* [sic] (Banks, 1895b): Aspöck *et al.* 2001: Taxonomic Serial No. 666308.

*Dichochrysa perfecta* (Banks, 1895b). **EMENDATION.**

### **SYNONYMY PERTAINING TO CANADA**

*Mallada perfectus*: Garland 1982 [1984]: 258–260, 409, Figs. 74, 118–122, Map 22; Adams and Garland 1983: 240–241, 243–245; Garland 1984: 94; 1985a: 737–751; Scudder 1994: 45.

**CANADA: T = 18** (10♂, 7♀, 1?). **FIRST RECORD:** BC: 1♀, W[est] Summerland, 26.vii.1963 (G.J. Spencer) [SEM]. **FLIGHT PERIOD:** July 19 (1989; Oliver BC)–September 3 (1976; Penticton BC).

**BC: T = 18** (10♂, 7♀, 1?). **FIRST RECORD:** 1♀, W[est] Summerland, 26.vii.1963 (G.J. Spencer) [SEM]. **NEW RECORDS:** 1♀, Oliver, U.B.C. Geology Camp, at light, 19.vii.1989 (S. Cannings) [SEM]. **FLIGHT PERIOD:** July 19 (1989; Oliver)–September 3 (1976; Penticton). **LOCALITIES:** Oliver [49°11'N 119°33'W; SEM]. Penticton [49°30'N 119°35'W; LEM]. W[est] Summerland [Summerland, 49°36'N 119°40'W; SEM].

*Dichochrysa perfecta* occurs in Canada, in the southern interior of British Columbia. All Canadian localities reported in literature have been authenticated. One potentially misleading report, i.e., Smith (1932, as *Chrysopa cockerelli*; cited by Penny *et al.* 1997, as *Pseudomallada perfectus*), traces back to a specimen now referred to *Meleoma emuncta* (which see, below). All specimens reported here are documented with data in Garland (1982 [1984]), or as new records (above). This is one of five species of Chrysopidae that have been designated as potentially rare and endangered in British Columbia (Scudder 1994). Larvae of this species have been described (Smith 1922, as *Chrysopa perfecta*).

### **GENUS EREMOCHRYSA Banks, 1903**

*Eremochrysa* Banks, 1903: 158. Type species: *Chrysopa punctinervis* MacLachlan, 1869; original designation.

*Lolochrysa* Banks, 1950: 59 [as subgenus of *Eremochrysa* Banks. Type species: *Eremochrysa hageni* Banks, 1903; original designation (Brooks and Barnard 1990: 215)].

*Eremochrysa* is represented by 19 species in North America and the Caribbean (Brooks and Barnard 1990). Larvae are trash-carriers (Monserrat *et al.* 2001). There are two subgenera, *Eremochrysa* and *Chrysopiella*, and both are represented in Canada.

### **SUBGENUS CHRYSOPIELLA Banks, 1911**

*Chrysopiella* Banks, 1911: 344. Type species: *Chrysopa sabulosa* Banks, 1898; original designation.

*Eremochrysa* (*Chrysopiella*) Banks, 1911: Brooks and Barnard 1990: 215, 272.

This subgenus includes four species, all from western North America (Bickley and MacLeod 1956; Adams and Garland 1981; Brooks and Barnard 1990). Larvae are trash-carriers (Monserrat *et al.* 2001). Adults are

<sup>196</sup>Available from: [www.Nearctica.com](http://www.Nearctica.com) (October 2006)

pollen-feeders (Adams and Garland 1981; Brooks and Barnard 1990). One species ranges into Canada, as follows:

***EREMOCHRYSA (Chrysopiella) BREVISETOSA (Adams and Garland, 1981)***

*Chrysopiella brevisetosa* Adams and Garland, 1981: 1–4. Type: male; USA: Utah (Jensen, Uintah County); original designation; American Museum of Natural History<sup>197</sup>.

*Eremochrysa (Chrysopiella) brevisetosa* (Adams and Garland, 1981): Brooks and Barnard 1990: 215–217, 272.

**SYNONYMY PERTAINING TO CANADA**

*Chrysopiella brevisetosa*: Adams and Garland 1981: 1–4; Garland 1982 [1984]: 122–126, 308, Figs. 36–41, 74, Map 8; 1984: 93; 1985a: 737–751.

*Eremochrysa (Chrysopiella) brevisetosa*: Penny *et al.* 1997: 53.

**CANADA: T = 1 (♂). FIRST RECORD:** AB: 1♂, Drumheller, 14.vi.1946 (E.H. Strickland) [UAE]. **FLIGHT PERIOD:** June 14 (1946; Drumheller AB).

**AB: T = 1 (♂). FIRST RECORD:** 1♂, Drumheller, 14.vi.1946 (E.H. Strickland) [UAE]. **FLIGHT PERIOD:** June 14 (1946; Drumheller). **LOCALITIES:** Drumheller [51°24'30"N 112°38'40"W; UAE<sup>198</sup>].

*Eremochrysa (Chrysopiella) brevisetosa* occurs in Canada, in Alberta. The one Canadian locality reported in literature has been authenticated, and label data are documented in Adams and Garland (1981), and in Garland (1982 [1984]). In the original description, Adams and Garland (1981) noted that the gut of one specimen contained pollen resembling *Atriplex* (Chenopodiaceae).

**SUBGENUS *EREMOCHRYSA (Eremochrysa) Banks, 1903***

*Eremochrysa* Banks, 1903: 158. Type species: *Chrysopa punctinervis* MacLachlan, 1869; original designation.

*Eremochrysa (Eremochrysa)* Banks, 1903: Brooks and Barnard 1990: 218, 272.

*Eremochrysa* is largely restricted to southwestern United States, northwestern Mexico, and the Caribbean (Monserrat *et al.* 2001). Three species of this subgenus occur in Canada, as follows:

***EREMOCHRYSA (EREMOCHRYSA) CANADENSIS (Banks, 1911)***

*Chrysopa canadensis* Banks, 1911: 339–340. Type: female; CANADA: Go Home, Lake Huron [Ontario]; monotypy; MCZ No. 11379 [examined].

*Eremochrysa (Lolochrysa) canadensis* (Banks, 1911): Banks 1950: 64–67.

*Eremochrysa (Eremochrysa) canadensis* (Banks, 1911): Brooks and Barnard 1990: 272.

**SYNONYMY PERTAINING TO CANADA**

*Chrysopa canadensis*: Banks 1911: 339–340; Gibson 1912: 110; Smith 1932: 591.

*Eremochrysa canadensis*: Banks 1950: 64–67; Bickley and MacLeod 1956: 200; Throne 1971: 76; Garland 1982 [1984]: 105–109, 306–307, Figs. 15–22, 35, 74, Map 5; 1984: 94; 1985a: 737–751.

*Eremochrysa (Eremochrysa) canadensis*: Penny *et al.* 1997: 54.

**CANADA: T = 4 (1♂, 2♀, 1?). FIRST RECORD:** ON: 1♀, Go Home, 13.vii.1907 [collector unknown; MCZ]. **FLIGHT PERIOD:** July 13 (1907; Go Home ON)–August 2 (1956; Magnetawan ON).

**BC: T = 1 (♂). FIRST RECORD:** 1♂, Penticton, at light, 16.vii.1976 (J.A. Garland) [LEM]. **FLIGHT PERIOD:** July 16 (1976; Penticton). **LOCALITIES:** Penticton [49°30'N 119°35'W; LEM].

**ON: T = 2 (1♀, 1? [a forewing]). FIRST RECORD:** 1♀, Go Home, 13.vii.1907 [collector unknown;

197. Available from: [http://research.amnh.org/invertzoo/types\\_db/details.php?specimen\\_id=7381](http://research.amnh.org/invertzoo/types_db/details.php?specimen_id=7381) (October, 2006)

198. Paratype. Terminalia stored in glycerine in a microvial pinned below the specimen.

MCZ<sup>1991</sup>. **FLIGHT PERIOD:** July 13 (1907; Go Home)–August 2 (1956; Magnetawan, 6 mi[les] W). **LOCALITIES:** Go Home [45°00'N 79°56'W; MCZ]. Magnetawan, Parry Sound District, 6 mi[les] W [45°38'N 79°41'W; UMAA<sup>200</sup>].

**QC: T = 1** (♀). **FIRST RECORD:** 1♀, Knowlton, 29.vii.1930 (L.J. Milne) [CNC]. **FLIGHT PERIOD:** July 29 (1930; Knowlton). **LOCALITIES:** Knowlton [45°13'02"N 72°31'01"W; CNC].

*Eremochrysa canadensis* occurs in Canada, in British Columbia, Ontario, and Quebec. All Canadian localities reported in literature have been authenticated. All specimens reported here are documented with data in Garland (1982 [1984]). Based on label data, adults come to light. In Canada, this species has an apparently disjunct distribution, which more collecting may resolve; in the eastern USA, it ranges from Wisconsin (Throne 1971) to Maine, Massachusetts and New Hampshire (Banks 1950), and south to Virginia (Roble and Flint 2001).

### ***EREMOCHRYSA (EREMOCHRYSA) FRATERNA* (Banks, 1898)**

*Chrysopa fraterna* Banks, 1898: 174–175.<sup>201</sup> Type: USA: Colorado (Fort Collins); original designation; female, MCZ (Penny *et al.* 1997).

*Eremochrysa fraterna* (Banks, 1898): Banks 1903: 159.

*Eremochrysa (Eremochrysa) fraterna* (Banks, 1898): Brooks and Barnard 1990: 272.

#### **SYNONYMY PERTAINING TO CANADA**

*Eremochrysa fraterna*: Smith 1932: 582; Spencer 1942: 26; Garland 1982 [1984]: 110–115, 307, Figs. 14, 23–28, 35, Map 6; 1984: 94; 1985a: 737–751.

*Eremochrysa (Eremochrysa) fraterna*: Penny *et al.* 1997: 54.

**CANADA: T = 13** (5♂, 8♀). **FIRST RECORD:** BC: 2♀, Seton Lake, Lillooet, 28.v.1926 (J. McDunnough) [CNC]. **FLIGHT PERIOD:** May 15 (1959; Vaseux Lake BC)–August 13 (1986; Penticton BC).

**BC: T = 13** (5♂, 8♀). **FIRST RECORD:** 2♀, Seton Lake, Lillooet, 28.v.1926 (J. McDunnough) [CNC]. **NEW RECORDS:** 1♀, Penticton, 13.viii.1986 (S.G. Cannings) [SEM]. **FLIGHT PERIOD:** May 15 (1959; Vaseux Lake)–August 13 (1986; Penticton). **LOCALITIES:** Oliver / Oliver, McIntyre Cr[ee]k [49°11'N 119°33'W; CNC]. Penticton / Penticton, 2800–3000 ft [853–914 m, vicinity of Carmi Road E of Penticton] [49°30'N 119°35'W; LEM, SEM]. Seton Lake, Lillooet [50°41'N 122°07'W; CNC]. Vaseux L[ake], Oliver [Vaseux Lake, 49°17'N 119°32'W; CNC].

*Eremochrysa fraterna* occurs in Canada, in British Columbia. All Canadian localities reported in literature have been authenticated. All specimens reported here are documented with data in Garland (1982 [1984]), or as new records (above).

### ***EREMOCHRYSA (EREMOCHRYSA) PUNCTINERVIS* (MacLachlan, 1869)**

*Chrysopa punctinervis* MacLachlan, 1869: 24. Lectotype: female; USA: Texas (Bosque County); subsequent designation and transfer to BMNH (Kimmins 1940: 449).

*Eremochrysa punctinervis* (MacLachlan, 1869): Banks 1903: 159.

*Eremochrysa (Eremochrysa) punctinervis* (MacLachlan, 1869): Brooks and Barnard 1990: 218, 272.

#### **SYNONYMY PERTAINING TO CANADA**

*Eremochrysa punctinervis*: Smith 1932: 583; Spencer 1942: 26; Garland 1982 [1984]: 115–120, 307–308, Figs. 15, 29–35, Map 7; 1984: 94; 1985a: 737–751; Scudder 1994: 44.

*Eremochrysa (Eremochrysa) punctinervis*: Penny *et al.* 1997: 54.

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199. Holotype. MCZ No. 11379, Banks Collection.

200. All that remains of this record is a single forewing: Garland 1982 [1984]: 109.

201. Date of issue of parts of Vol. IV: No. 2 (pp.49–176), March 21, 1898.

**CANADA: T = 36** (3♂, 33♀). **FIRST RECORD:** BC: 1♀, Oliver, 23.v.1923 (C.B. Garrett) [CNC]. **FLIGHT PERIOD:** May 23 (1923; Oliver BC)–September 4 (1976; Penticton BC).

**BC: T = 36** (3♂, 33♀). **FIRST RECORD:** 1♀, Oliver, 23.v.1923 (C.B. Garrett) [CNC]. **NEW RECORDS:** 1♀, Osoyoos, Haynes E.R. [Ecological Reserve], 15.v.–17.vi.2001 (G.G.E. Scudder) / BGxh1 AN, recovery after fire, pitfall trap LR2-4 [SEM]. 1♀, Osoyoos, Desert Centre, 49°03'N 119°31'W, attracted to light, 28.viii.2003 (G.G.E. Scudder) [SEM]. **FLIGHT PERIOD:** May 23 (1923; Oliver)–September 4 (1976; Penticton). **LOCALITIES:** Oliver / Oliver, 1000 ft [305 m] [49°11'N 119°33'W; CNC]. Osoyoos, Haynes Ecological Reserve [49°02'N 119°27'W; SEM]. Osoyoos, Desert Centre, 49°03'N 119°31'W [SEM]. Penticton / Penticton, 2800–3000 ft [853–914 m, vicinity of Carmi Road E of Penticton] [49°30'N 119°35'W; LEM]. Seton Lake, Lillooet [50°41'N 122°07'W; CNC]. South Okanagan [Regional District of Okanagan-Similkameen, 49°25'N 120°00'W; CNC].

*Eremochrysa punctinervis* occurs in Canada, in British Columbia. All Canadian localities reported in literature have been authenticated. All specimens reported here are documented with data in Garland (1982 [1984]), or as new records (above). Based on label data, adults come to light. This is one of five species of Chrysopidae that have been designated as potentially rare and endangered in British Columbia (Scudder 1994).

## GENUS *MELEOMA* Fitch, 1855

*Meleoma* Fitch, 1855: 786; 1856: 81–82. Type species: *Meleoma signoretti* Fitch, 1855; monotypy.

*Meleoma* is a New World genus (New 2001). It is distributed from North America to northern South America (Brooks and Barnard 1990), with 28 described species (Penny 2006). Larvae are generally naked (Monserrat *et al.* 2001). In Canada, there are four species, as follows:

### *MELEOMA DOLICHARTHRA* (Navás, 1914)

*Chrysopa dolicharthra* Navás, 1914: 96. Type: male; GUATEMALA: Capetillo; original designation; BMNH (Kimmins 1940: 448–449).

*Meleoma dolicharthra* (Navás, 1914): Kimmins 1940: 448–449.

### SYNONYMY PERTAINING TO CANADA

*Meleoma cavifrons*: Toschi 1965: 402.

*Meleoma dolichartha* [sic]: Tauber 1969: 35–37, 72.

*Meleoma dolicharthra*: Garland 1979: 745; 1982 [1984]: 80–83, 296, Figs. 1, 3, 4, 11–13, Map 2; 1984: 94; 1985a: 737–751; Penny *et al.* 1994: 55; Garland 2000: 40.

*Meleoma emuncta*: Smith 1932: 583 [part].

**CANADA: T = 18** (7♂, 11♀). **FIRST RECORD:** BC: 1♂, 1♀, Kaslo, 24.vi.[1903]<sup>202</sup> (R.P. Currie) [USNM]. **FLIGHT PERIOD:** April 30 (1931; Langley BC)–September 11 (1962; Victoria BC).

**BC: T = 18** (7♂, 11♀). **FIRST RECORD:** 1♂, 1♀, Kaslo, 24.vi.[1903] (R.P. Currie) [USNM]. **NEW RECORDS:** 2♂, Victoria, at light, 19.viii.1961 (FIS No. 61-2487-44) [collector unknown; PFRC]. **FLIGHT PERIOD:** April 30 (1931; Langley)–September 11 (1962; Victoria). **LOCALITIES:** Galiano I[sland], Spanish Hills [48°56'N 123°27'W; SEM]. Kaslo [49°55'N 116°55'W; USNM]. Langley [49°06'N 122°39'W; SEM]. Pavilion Lake [50°52'N 121°44'W; CNC]. Penticton, 2800–3000 ft [853–914 m, vicinity of Carmi Road E of Penticton] [Penticton, 49°30'N 119°35'W; LEM]. Radium Hot Springs [50°37'N 116°04'W; CNC<sup>203</sup>]. Seton

202.R.P. Currie spent 10 weeks in the summer of 1903 collecting insects in the company of H.G. Dyar and A.N. Caudell of the U.S. National Museum (Natural History) in the Kootenay District of British Columbia. Currie and Dyar both wrote accounts of this trip (Currie 1904; Dyar 1904).

203.Record from Radium Hot Springs, FIS 1950, A-2353A [CNC], has a cocoon pinned with the specimen.



Lake, Lillooet [50°41'N 122°07'W; CNC]. Sugar Lake [50°24'N 118°31'W; CNC]. U[niversity of] B[ritish] C[olumbia] Forest n[ear] Haney, 1100 ft [335 m], Garibaldi P[ar]k [Garibaldi Park, 50°00'N 122°45'W; CNC]. Victoria [48°26'N 123°22'W; CNC<sup>204</sup>, PFRC].

*Meleoma dolicharthra* occurs in Canada, in British Columbia, both coastal and interior. All Canadian localities reported in literature have been authenticated. The record from Seton Lake, discussed by Smith (1932: 583, as *Meleoma emuncta*), follows:

“There is a female specimen in the Canadian National collection, collected by J. McDunnough at Seton Lake, B.C., May 28, 1926, which may be a new variety of *emuncta*. It has the general characters of *emuncta*, but the pronotum is margined by two broad, brown bands similar to *gravida*. There is an extra black mark from the base of the antennae along the lateral borders of the clypeus.”

Smith recognised the novelty of this specimen, but not its true identity; credit for that belongs to Tauber (1969: 36, as *Meleoma dolicharthra* [*sic*]: Seton Lake, Lillooet, ♀, V-28-26 (J. McDunnough, CNC)). All specimens reported here are documented with data in Garland (1982, 2000), or as new records (above). Based on label data, adults have been taken at light, and at a window (probably attracted to light). Also from label data, adults have been reared from larvae found on: **PINUS MONTICOLA**: Sugar Lake BC [FIS 1943, BC-4054C; CNC]. **PSEUDOTSUGA MENZIESII**: Radium Hot Springs BC [FIS 1950, A-2353A, as D[ouglass] Fir; CNC]. Biology and immature stages of this species have been studied in California (Toschi 1965, as *Meleoma cavi-frons*); Tauber (1969) also included biological information in the context of adult variation.

### **MELEOMA EMUNCTA (Fitch, 1855)**

*Chrysopa emuncta* Fitch, 1855: 792; 1856: 88. Type: female (Banks 1924: 432); USA: New York [State]; original designation; MCZ (Penny *et al.* 1997: 55).

*Meleoma emuncta* (Fitch, 1855): Banks 1924. Bull. Mus. Comp. Zool. 65: 432.

### SYNONYMY PERTAINING TO CANADA

*Chrysopa cockerelli*: Smith 1932: 597; Spencer 1942: 27; Bickley and MacLeod 1956: 195 [part]; Brown and Clark 1956: 682.

*Chrysopa plorabunda*: Provancher 1869: 140; 1871a: 142; 1871b: 269; 1877a: 121; 1877b: 203, 205; Brodie and White 1883.

*Meleoma emuncta*: Putman 1932b: 121, 123; Smith 1932: 583, 599; Putman 1937: 36–37; Spencer 1942: 26; Garlick 1955: 326, 329; Bickley and MacLeod 1956: 185; Tjeder 1960: 148; Grobler 1962: 40; Tauber 1969: 22–27, 69; Throne 1971: 68; Garland 1979: 745; 1982 [1984]: 90–102, 300–306, 411, Figs. 1, 7–13, Map 4; 1984: 94; 1985a: 737–751, 757, 758; Penny *et al.* 1997: 55; Garland 2000: 40.

*Meleoma slossonae*: Banks 1903: 157–162, pl. II; Fyles 1903: 29.

*Meleoma verticalis*: Banks 1908: 259–260; Gibson 1910: 127; Smith 1932: 583–584; Spencer 1942: 27; Bickley and MacLeod 1956: 185–186.

*Pseudomallada perfectus*: Penny *et al.* 1997: 57 (part).

**CANADA: T = 305** (77♂, 227♀, 1?). **FIRST RECORD**: BC: 1♀, Kaslo, 8.vii.[1903] (R.P. Currie) [USNM]. **FLIGHT PERIOD**: May 10 (1916; Victoria BC)–November 4 (1972; Sherbrooke QC).

**AB: T = 2** (♀). **FIRST RECORD**: 1♀, Wabamun, 20.viii.1954 (B. Hardy) / (ex B.A. Hardy Coll[ectio]n, SEM 2000) [SEM]. **NEW RECORDS**: 1♀, Edmonton, *Picea glauca*, 19.vii.[19]82 [collector unknown] [NFRC]. 1♀, Wabamun, 20.viii.1954 (B. Hardy) / (ex B.A. Hardy Coll[ectio]n, SEM 2000) [SEM]. **FLIGHT PERIOD**: July 19 (1982; Edmonton)–August 20 (1954; Wabamun). **LOCALITIES**: Edmonton [53°33'N 113°28'W; NFRC]. Wabamun [53°33'N 114°28'W; SEM].

**BC: T = 68** (14♂, 54♀). **FIRST RECORD**: 1♀, Kaslo, 8.vii.[1903<sup>205</sup>] (R.P. Currie) [USNM]. **FLIGHT PERIOD**: May 10 (1916; Victoria)–September 16 (1976; Penticton). **LOCALITIES**: Ainsworth [Ainsworth Hot

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204.A 1962 specimen from Victoria [CNC] is female, not male as reported by Tauber (1969: 36; as *Meleoma dolicharthra* [*sic*]); corrected by Garland (1982 [1984]).

Springs, 49°44'N 116°55'W; USNM]. Chilliwack [49°10'30"N 121°56'30"W; CNC]. Cowichan Lake [Lake Cowichan, 48°49'N 124°03'W; SEM]. Departure Bay [49°12'N 123°58'W; CNC, SEM]. Galiano I[sland] / Galiano I[sland], Spanish Hills [48°56'N 123°27'W; SEM]. Kaslo [49°55'N 116°55'W; USNM]. Kootenay L[ake] [49°40'N 116°50'W; ROM]. Lakelse L[ake] Bog, S[outh] Terrace [Lakelse Lake Provincial Park, 54°23'N 128°31'W; CNC]. Langford [48°27'N 123°30'W; CNC]. Lillooet [50°41'N 121°56'W; CNC]. Nanaimo [49°10'N 123°56'W; ROM, UWO]. Penticton / Penticton, 2800–3000 ft [853–914 m, vicinity of Carmi Road E of Penticton] [49°30'N 119°35'W; LEM]. Quesnel [53°00'N 122°30'W; SEM]. Revelstoke [50°59'N 118°12'W; USNM]. Skeena R[iver], Terrace [54°01'N 130°07'W; CNC]. Terrace [54°31'N 128°36'W; CNC, ROM]. U[niversity of] B[ritish] C[olumbia] [Vancouver, 49°15'N 123°07'W; SEM]. Vancouver [49°15'N 123°07'W; CNC, MCZ]. Vancouver Isl[and] [49°30'N 125°30'W; MCZ]. Victoria [48°26'N 123°22'W; CNC<sup>206</sup>].

**MB: T = 1** (♂). **FIRST RECORD:** 1♂, Cedar Lake, 20–30.vi.1936 (F.M. Carpenter & C.T. Parsons) [MCZ]. **FLIGHT PERIOD:** June 20–30 (1936; Cedar Lake). **LOCALITIES:** Cedar Lake [53°19'45"N 100°10'08"W; MCZ].

**NB: T = 12** (1♂, 11♀). **FIRST RECORD:** 1♀, S[ain]t John, 1932 (F. Lord) [UG]. **NEW RECORDS:** 1♀, Kouchibouguac N[ational] P[ark], Code 5852B, 18.viii.1977 (D.B. Lyons) [CNC]. **FLIGHT PERIOD:** June 18 (1934; Fredericton)–August 25 (1968; McGraw Brook, and Sussex). **LOCALITIES:** Boom Road, North[umberland] Co[unty] [46°57'N 65°47'W; MFRC]. Campbellton [47°59'41"N 66°40'52"W; NDFRC]. F[rederic]ton / Fredericton [45°56'43"N 66°40'00"W; CNC, ROM]. Kouchibouguac N[ational] P[ark], Code 5852B [Kouchibouguac National Park of Canada, 46°51'30"N 64°58'30"W; CNC]. McGraw B[rook] [46°49'N 66°07'W; NDFRC]. Petitcodiac [45°56'21"N 65°10'53"W; USNM]. Red Bank [conflicting place names; CNC]. S[ain]t John [45°15'33"N 66°02'20"W; UG]. S[ain]t Quentin [Saint-Quentin, 47°30'36"N 67°23'19"W; NDFRC]. Sussex [45°43'21"N 65°30'28"W; NDFRC].

**NL: T = 24** (8♂, 16♀). **FIRST RECORD:** 3♂, 2♀, Eastport, 9.vii.1961 (C.P. Alexander) [USNM]. **FLIGHT PERIOD:** June 21 (1971; Terra Nova National Park of Canada, Saltons Brook)–August 24 (1976; Pynn's Brook). **LOCALITIES:** Eastport [48°39'N 53°45'W; USNM]. Exploits R[iver] n[ear] Bishop's Falls [Bishop's Falls, 49°01'N 55°29'W; USNM]. Pynn's Brook [48°57'N 55°53'W; SJARS]. Romaine Br[oo]k [Romaines Brook, 48°33'N 58°40'W; USNM]. S[ain]t George's / S[ain]t George's, 3 mi[les] SE [48°26'N 58°29'W; SJARS, USNM]. S[ain]t John's [47°34'N 52°44'W; NDFRC, SJARS]. Shoal H[arbour] [48°11'N 53°59'W; SJARS]. Terra Nova N[a]t[ional] P[ark], Salton B[rook] [Saltons Brook, 48°35'N 53°57'W; MU].

**NS: T = 50** (27♂, 22♀, 1?). **FIRST RECORD:** 3♂, 1♀, Pictou, 22.vii.1914 (E.M.W[alker]) [ROM]. **NEW RECORDS:** 1♀, [Kentville Research Station], apple, rear Header House, 10.viii.1956 (M. Sanford<sup>207</sup>) [CNC]. 1♂, C[ape] B[reton] H[ighlands] N[a]t[ional] P[ark], Clyburn Brook, PG964700, 12.vii.1983 / Coll[ector] D.M. Wood [CNC]. 1♀, C[ape] B[reton] H[ighlands] N[ational] P[ark], Pleasant Bay, PG682872, 10–15.viii.1983 (J.E.H. Martin) [CNC]. **FLIGHT PERIOD:** June 22 (1968; Chester)–September 11 (1961; West Dover). **LOCALITIES:** Armdale, Halifax Co[unty] [44°38'N 63°38'W; NSM]. Baddeck, Cape Breton [Island] [46°06'N 60°45'W; MCZ]. C[ape] B[reton] H[ighlands] N[a]t[ional] P[ark], Clyburn Brook, PG964700 [Clyburn Brook, 46°40'N 60°24'W; CNC]. C[ape] B[reton] H[ighlands] N[ational] P[ark], Pleasant Bay, PG682872 [Pleasant Bay, 46°49'N 60°48'W; CNC]. Chester [44°33'N 64°15'W; NSM]. Debert [45°26'N 63°28'W; NDFRC, NSM]. Kentville [45°05'N 64°30'W; CNC]. Lac Ainslee, Cape Breton Is[land] [Lake Ainslie, 46°08'N 61°11'W; NSM]. Lawrence Town [Lawrencetown, 44°53'N 65°10'W; NDFRC]. MacNabs

205.R.P. Currie spent 10 weeks in the summer of 1903 collecting insects in the company of H.G. Dyar and A.N. Caudell of the U.S. National Museum (Natural History) in the Kootenay District of British Columbia. Currie and Dyar both wrote accounts of this trip (Currie 1904; Dyar 1904).

206.Record: 1♀, Victoria, 10.v.1916 (R.C. Treherne) / (*Chrysopa cockerelli* Banks, Det. R.C. Smith) / (*Meleoma emuncta* (Fitch), Det. C. Tauber '68); this is Smith's (1932: 597) *Chrysopa cockerelli*.

207.M. Sanford, 1955–56, Agriculture Canada, Kentville Research Station (MacLellan 1986: 181; photo: p.125).

Island [45°42'N 60°48'W; CNC]. Malagash Mines, Cumberland Co[unty] [Malagash, 45°46'N 63°23'W; MFRC]. North Sydney, Cape Breton Is[land] [46°13'N 60°15'W; NSM]. Pictou [45°41'N 62°43'W; ROM]. Purcell's Cove, Halifax Co[unty] [Purcells Cove, 44°37'N 63°34'W; NSM]. Truro [45°22'N 63°16'W; NSM]. West Dover, Halifax Co[unty] [44°29'N 63°52'W; NSM]. Wolfville [45°05'N 64°22'W; CNC, MCZ].

**ON: T = 30** (8♂, 22♀). **FIRST RECORD:** 2♀, Rostrevor, 2.ix.1907 (Arthur Gibson) [CNC]. **FLIGHT PERIOD:** June 16 (1977; Joe Lake, Algonquin Park)–September 12 (1968; Port Credit). **LOCALITIES:** Algonquin Park [see Joe Lake]. Bancroft [45°02'N 77°45'W; ROM]. Bass Cr[ee]k, Lake Nipissing [45°48'N 82°01'W; ROM]. Bigwin Island [45°14'N 79°02'W; UWO]. Biscotasing [47°17'N 82°06'W; CNC]. Chaffey's Locks [44°35'N 76°19'W; ROM]. Echo Lake, Baysville, Muskoka District [44°58'N 79°33'W; ROM]. Fraserburg, Muskoka District [45°04'N 79°09'W; ROM]. Hamilton [43°14'N 79°57'W; ROM]. Horning's Mills, E[ast] Cr[ee]k [44°09'N 80°12'W; ROM]. Iron Bridge [46°17'N 83°14'W; CNC]. Joe Lake, Algonquin P[ar]k [45°35'N 78°43'W; APM, CNC]. Kap-Kig-Iwan Prov[incial] P[ar]k, Englehart, Timiskaming District [47°48'N 79°53'W; ROM]. Kirkwood T[ownshi]p<sup>208</sup> [Algoma District, 46°20'N 83°31'W; CNC]. Niagara [43°00'N 79°15'W; UG]. Port Credit [43°33'N 79°35'W; ROM]. Rosspport Prov[incial] P[ar]k, 2 mi[les] E Rosspport, Thunder Bay District [ROM]. Rostrevor [45°11'N 79°33'W; CNC]. S[ault] S[ainte] Marie [46°31'N 84°20'W; UG]. Smoky Falls, Mattagami R[iver] / Smoky Falls, Kapuskasing [50°04'N 82°10'W; CNC, ROM]. Sudbury [46°31'N 80°54'W; ROM]. Timmins [48°28'N 81°20'W; GLFRC].

**PE: T = 1** (♀). **FIRST RECORD:** (unspecified locality): 1♀, 2.viii.1949 (J.E.C.) [LEM]. **FLIGHT PERIOD:** August 2 (1949). **LOCALITIES:** (unspecified) [LEM].

**QC: T = 116** (18♂, 98♀). **FIRST RECORD:** 1♂, Montfort, Laurentian Mts., 30.vi.1916 [collector unknown; CU<sup>209</sup>]. **NEW RECORDS:** 1♀, Verendrye Prov[incial] P[ar]k, Lucie L[a]k[e], 46°58'N 76°28'W, Fit. Mixed Forest, 16.vi–11.viii.1987 [collector unknown; CNC]. **FLIGHT PERIOD:** June 7 (1923; Hemmingford)–November 4 (1972; Sherbrooke). **LOCALITIES:** (unspecified locality) [UL Provancher Collection 1 and 2]. Belisle Beach, Luskville [45°32'N 76°01'W; CNC]. Berthierville [46°05'N 73°11'W; CRFL]. Brandy Pot [Brandy Pond, 45°41'19"N 72°02'02"W; UL]. Canton Rouyn, C[om]té R[ouyn]–Noranda [48°15'N 78°59'W; CSQ]. Charlevoix Co[unty] [Charlevoix, Comté, 47°29'N 70°29'W; LEM]. C[om]té Megantic [Mégantic, District judiciaire, 45°35'N 70°53'W; CSQ]. Covey Hill [45°01'06"N 73°45'20"W; CNC]. Duchesnay, Portneuf [Duchesnay, Barrage de, 46°52'02"N 71°38'15"W; CSQ]. Frelighsburg, Missisquoi [45°03'N 72°50'W; UL]. Hemmingford [45°03'N 73°35'W; CNC]. Kirks Ferry [Kirk's Ferry, 45°32'30"N 75°49'00"W; CNC<sup>210</sup>]. Knowlton [45°13'02"N 72°31'01"W; CNC]. Lac Mondor, S[ain]te Flore [Lac-Mondor, Sainte-Flore, 46°37'32"N 72°45'52"W; CNC<sup>211</sup>]. Lac Serpent, N[otre] D[ame] du Laus [Lac-Serpent, Notre-Dame-du-Laus, 46°09'N 75°30'W; LEM]. Laniel [47°03'N 79°16'W; CNC]. Laurentide P[ar]k, le Relais, 2500 ft [762 m] [Laurentides, Réserve faunique, 47°45'N 71°15'W; CNC]. Laval [45°35'N 73°45'W; LEM]. Lorraine [45°41'N 73°47'W; UdeM]. Montfort, Laurentian M[oun]t[ain]s [45°53'10"N 74°20'23"W; CU]. Montreal [Montréal, 45°31'N 73°39'W; UdeM]. Parc du Mont Tremblant [Mont-Tremblant, Parc national du, 46°26'N 74°21'W; UdeM]. Quebec [Québec, 46°49'N 71°13'W; USNM]. Queen's Park, Aylmer [Queens Park, 45°24'36"N 75°53'21"W; CNC]. S[ain]t Augustin, Port[neuf] [Saint-Augustin, 48°48'N 71°57'W; CRFL]. S[ain]t Hippolyte [Saint-Hippolyte, 45°56'N 74°01'W; UdeM]. S[ain]t Theodore de Chertsey / S[ain]t Theodore de Chertsey, 7<sup>th</sup> Lake [Saint-Théodore-de-Chertsey, 46°04'20"N 73°53'13"W; LEM]. S[ain]te Angèle de Merici [Sainte-Angèle-de-Méridi, 48°32'N 68°05'W; UdeM]. S[ain]te Foy [Sainte-Foy–Sillery, 46°46'15"N 71°17'00"W; CRFL]. Seigneurie Lac Metis, C[om]té Matapédia [Lac Métis, 49°10'N 69°45'W; CSQ]. Shawbridge [45°52'17"N 74°04'45"W; LEM]. Sherbrooke [45°24'N 71°54'W; CRFL]. Tadoussac [48°09'N

208. Tauber (1969: 23) placed Kirkwood Township in British Columbia. In fact, Kirkwood Township is north of Thessalon ON, as noted by Garland (1985). A single specimen (♀, 31.viii.1960 (J.H. Grobler) [CNC]) corroborates the study by Grobler (1962).

209. Label data without gender provided by L.L. Pechuman *in litt.* 1980.

210. Tauber (1969: 24; as *Meleoma emuncta*) listed five females from Kirk's Ferry QC, which in fact were a mixed series of *M. emuncta* and *M. signoretti*; corrected by Garland (1982 [1984]).

211. Tauber (1969: 24) attributed a number of records to Knowlton QC, which in fact should have been attributed to Lac-Mondor, Sainte-Flore QC; corrected by Garland (1982 [1984]).



69°43'W; LEM]. Verendrye Prov[incial] P[ar]k, Lucie L[a]k[e], 46°58'N 76°28'W [Lac Lucie, La Vallée-de-la-Gatineau, 46°58'N 76°29'W; CNC].

**SK: T = 1** (♀). **FIRST RECORD:** 1♀, Carrot River, ([F.I.S.] 4-393-01, Rec[eived] 16.viii.1968) / (*Caragana*, W68, 4-393-01) / (*Meleoma emuncta* Fitch, J.E.M.) [NFRC]. **NEW RECORDS:** 1♀, Carrot River, ([F.I.S.] 4-393-01, Rec[eived] 16.viii.1968) [collector unknown] / (*Caragana*, W68, 4-393-01) / (*Meleoma emuncta* Fitch, J.E.M.) [NFRC]. **FLIGHT PERIOD:** August 16 (1968; Carrot River). **LOCALITIES:** Carrot River [53°17'N 103°35'W; NFRC].

*Meleoma emuncta* occurs in Canada, in all provinces. A tentative record from Saskatoon SK (Smith 1932; as *Meleoma* species near *emuncta*) has been located [CNC] and is here referred to *Chrysopa oculata* (which see, above). Other names in literature for this species in Canada, are: *Chrysopa cockerelli* (Smith 1932; Spencer 1942; Bickley and MacLeod 1956; Brown and Clark 1956); *Chrysopa plorabunda* (Provancher 1869, 1871a, b, 1877a, b<sup>212</sup>; Brodie and White 1883); *Meleoma slossonae* (Banks 1903; Fyles 1903); *Meleoma verticalis* (Banks 1908; Gibson 1910; Smith 1932; Spencer 1942; Bickley and MacLeod 1956); and *Pseudomalada perfecta* (Penny *et al.* 1997).<sup>213</sup> Canadian localities in literature for which no specimen has been seen, are: St. Marys BC (Smith 1932; also cited by Spencer 1942); Corner Brook NL (Tjeder 1960); Glenwood NL (Tjeder 1960); Economy NS (Tjeder 1960); Grimsby ON (Putman 1932b); St. Davids ON (Putman 1932b); Vineland ON (Garlick 1955); Kazabazua QC (Smith 1932); Montmorency QC (Fyles 1903: 29; as *Meleoma slossonae*). All specimens reported here are documented with data in Garland (1982, 2000), or as new records (above). Based on label data, adults have been taken at light and at bait; one teneral adult pinned with its cocoon was reared from a larva found on Apple; and they have been associated with mixed forest, 'tourbe'[peat bog], Balsam Fir, *Caragana*, *Picea glauca*, Thimbleberry, Trembling Aspen, 'pin rouge'[Red Pine], 'saule pleureur' [Weeping Willow]. Also from label data, adults or their larvae have been found preying on aphids. Bionomic notes on this species in literature pertaining to Canada have been summarised (Garland 1985a). Biology and immature stages of this species have been studied in California (Toschi 1965, as *Meleoma comata*); Tauber (1969) also included biological information in the context of adult variation.

#### **MELEOMA SCHWARZI (Banks, 1903)**

*Chrysopa schwarzi* Banks, 1903: 146–147. Type: sex unknown [abdomen missing : Penny *et al.* 1997: 56]; USA: New Mexico (Las Vegas Hot Springs); original designation; USNM.

*Meleoma schwarzi* (Banks, 1903): Adams 1962: 178.

#### **SYNONYMY PERTAINING TO CANADA**

*Meleoma schwarzi*: Garland 1979: 745–746; 1982 [1984]: 77–80, 296, Figs. 1, 2, 11–13, Map 1; 1984: 94; 1985a: 737–751; Scudder 1994: 45; Garland 2001: 46.

**CANADA: T = 3** (♂). **FIRST RECORD:** BC: 1♂, Penticton, 2800–3000 ft, 13.vi.1977 (J.A. Garland) [LEM]. **FLIGHT PERIOD:** June 13–20 (1977; Penticton BC).

**BC: T = 3** (♂). **FIRST RECORD:** 1♂, Penticton, 2800–3000 ft, 13.vi.1977 (J.A. Garland) [LEM]. **FLIGHT PERIOD:** June 13–20 (1977; Penticton). **LOCALITIES:** Penticton, 2800–3000 ft [853–914 m, vicinity of Carmi Road E of Penticton] [Penticton, 49°30'N 119°35'W; LEM].

*Meleoma schwarzi* occurs in Canada, in the southern interior of British Columbia. All Canadian localities reported in literature have been authenticated. All specimens reported here are documented with data in Garland (1979, 1982). This is one of five species of Chrysopidae that have been designated as potentially rare and endangered in British Columbia (Scudder 1994).

212.Provancher's collection (UL) contained two females of *M. emuncta*, labelled in his own hand-writing as *Chrysopa plorabunda*, which he described (1877b: 205) as follows: "**Chrysope pleureuse.** *Chrysopa plorabunda*, Fitch. – Long[ure]. 68 pouce. Vert tendre avec une strie dorsale jaune. Tête jaune, avec une ligne noire au-dessous de l'œil. Palpes noirs annelés de blanc. Antennes blanchâtres, jaunâtres à l'extrémité, le second article sans tache. Pattes verdâtres, tarsi jaunâtres. Ailes hyalines, arrondies à l'extrémité, surtout les antérieures. - PC [peu commun]."

213.Part: BC, based on Smith 1932: 597, as *Chrysopa cockerelli* from Victoria.



## **MELEOMA SIGNORETTI Fitch, 1855**

*Meleoma signoretti* Fitch, 1855: 786; 1856: 82. Type: sex unknown; USA: Vermont (Mount Antonio, Rupert); original designation; depository unknown (Penny *et al.* 1997).

### **SYNONYMY PERTAINING TO CANADA**

*Meleoma emuncta*: Tauber 1969: 24 [part].

*Meleoma signoretti*: Putman 1932b: 121; Smith 1932: 584 [part]; Ross and Putman 1934: 37; Putman 1937: 29–37; Spencer 1942: 26 [part]; Bickley and MacLeod 1956: 185; Tauber 1969: 32–35, 71; Throne 1971: 67; Garland 1979: 745; 1982 [1984]: 84–90, 297–300, 411, Figs. 1, 5, 6, 11–13, 74, Map 3; 1984: 94; 1985a: 737–751, 757, 759; Penny *et al.* 1997: 56; Garland 2000: 40.

**CANADA: T = 111** (37♂, 72♀, 2?). **FIRST RECORD**: ON: 1♀, Toronto, 6.viii.1914 (E.M. Walker) [ROM]. **NEW RECORDS**: 1♀, [unspecified locality], 23.vii.1942 (FIS 1942, Rec[ord] 6588) [collector unknown; CNC]. 1♀, [unspecified locality], Rec[eived] 12-3-? [12.iii.19\_] (FIS, W-711C) [collector unknown; CNC<sup>214</sup>]. **FLIGHT PERIOD**: May 30 (1962; Toronto ON)–September 10 (1950; Kirk's Ferry QC).

**AB: T = 1** (♀). **FIRST RECORD**: 1♀, Rocky Mtn. House Distr., FIS 1943 BC-4380, on *Betula*, em[erged] (incubator) 26.ii.1944 [collector unknown; CNC]. **FLIGHT PERIOD**: [not known]. **LOCALITIES**: Rocky M[oun]t[ai]n House Distr[ict] [Rocky Mountain House, 42°22'N 114°55'W; CNC].

**BC: T = 8** (4♂, 4♀). **FIRST RECORD**: 1♀, W[est] Vancouver, 12.viii.[19]34 (G.H. Larnder) [SEM]. **FLIGHT PERIOD**: June 2 (1947; Trinity Valley)–September 6 (1962; Vancouver). **LOCALITIES**: Quesnel [53°00'N 122°30'W; SEM]. Trinity Valley [50°24'N 118°55'W; SEM]. U[niversity of] B[ritish] C[olumbia] Forest n[ea]r Haney, 1100 ft [335 m], Garibaldi P[ar]k [Garibaldi Park, 50°00'N 122°45'W; CNC]. Vancouver [49°15'N 123°07'W; SEM]. W[est] Vancouver [49°22'N 123°10'W; SEM].

**MB: T = 8** (2♂, 5♀, 1?). **FIRST RECORD**: 2♂, Ninette, 7.vi.1958 (R.B. Madge) [CNC]. **NEW RECORDS**: 1♀, Rennie, 16-8-[19]61 [collector unknown] / (Fl[u]or[escent] Lamp, 16-8-61) [NFRFC]. **FLIGHT PERIOD**: June 7 (1958; Ninette)–August 16 (1961; Rennie). **LOCALITIES**: Brandon [49°50'49"N 99°57'08"W; CNC]. Glenlea Research Station<sup>215</sup> [Glenlea, 49°38'08"N 97°08'06"W; LEM]. Ninette [49°24'00"N 99°37'48"W; CNC]. Rennie [49°51'10"N 95°33'10"W; NFRFC]. Stockton, 2 mi[les] W [49°35'22"N 99°27'11"W; CNC]. Winnipeg [49°53'04"N 97°08'47"W; CU].

**NS: T = 4** (2♂, 2♀). **FIRST RECORD**: 1♂, Baddeck, 23.vii.1931 (G. Fairchild) [MCZ]. **FLIGHT PERIOD**: July 7 (1944; Acadia Forest Station)–August 6 (1958; Kentville). **LOCALITIES**: Acadia Forest Sta[tion] [Debert, 45°26'N 63°28'W; CNC]. Baddeck [46°06'N 60°45'W; MCZ<sup>216</sup>]. Chester [44°33'N 64°15'W; NSM]. Kentville [45°05'N 64°30'W; CNC].

**ON: T = 47** (14♂, 33♀). **FIRST RECORD**: 1♀, Toronto, 6.viii.1914 (E.M. Walker) [ROM]. **FLIGHT PERIOD**: May 30 (1962; Toronto)–August 28 (1961; Toronto). **LOCALITIES**: Algonquin P[ar]k [45°33'N 78°35'W; APM]. Ausable River, Pinery Prov[incial] P[ar]k [Ausable River, 43°19'N 81°46'W; ROM]. Bala [45°01'N 79°37'W; CNC]. Belleville [44°14'N 77°21'W; LEM, UG]. B[ig] Rideau L[ake] [44°46'N 76°13'W; UG]. Cawaja Beach, Tiny T[ownshi]p, Simcoe Co[unty] [44°42'N 80°01'W; ROM]. Chaffey's Locks [44°35'N 76°19'W; ROM]. Fairbank [43°42'N 79°27'W; ROM]. Fraserburg, Muskoka District [45°04'N 79°09'W; ROM]. Guelph [43°33'N 80°15'W; UG]. Halls Lake [Haliburton; G.K. Morris, *in litt.* 1980; 45°07'N 78°46'W; UG, collected by G.K. Morris]. Head Lake, Algonquin Park [45°31'N 78°34'W; ROM]. Hornings [Horning's] Mills [44°09'N 80°12'W; ROM]. Kendal [44°02'N 78°32'W; ROM]. Marmora [44°29'N 77°41'W; UG]. Meaford [44°36'N 80°44'W; UG]. Merivale [45°19'N 75°43'W; CNC]. Montieth [Monteith; conflicting place names; CNC<sup>217</sup>]. One Sided Lake, Larsson's Camp [Claxton Township, Rainy River District<sup>218</sup>, 49°03'N

214.Cocoon and pupal exuvium attached to pin.

215.The University of Manitoba's Glenlea Research Station is located just south of Winnipeg.

216.Record based on a single specimen, label data in Tauber (1969: 33); not examined in this study.

217.Cocoon attached to pin.

93°54'W; ROM]. Ottawa [45°16'N 75°45'W; CNC]. Port Credit [43°33'N 79°35'W; ROM]. S[ain]t Davids [43°10'N 79°07'W; UG]. Silver Lake, Maberly [Silver Lake, Frontenac/Lanark, 44°50'N 76°36'W; LEM]. Sudbury [46°31'N 80°54'W; ROM]. Toronto [43°42'N 79°25'W; ROM].

**QC: T = 41** (15♂, 25♀, 1?). **FIRST RECORD:** 1♀, Montfort, Laurentian Mts., 30.vi.1916 [collector unknown; CU<sup>219</sup>]. **CORRECTED RECORDS:** 1♀, Kingsmere, 18.vii.1919 (R.H. Chrystal) [CNC]. Kirks Ferry, in light trap: 3♀.viii.1950; 1♀, 10.ix.1950 (B.P. Beirne) [CNC]. **FLIGHT PERIOD:** June 16 (1967; Sainte-Anne-de-Bellevue)–September 10 (1950; Kirk's Ferry). **LOCALITIES:** Berthierville [46°05'N 73°11'W; CRFL]. Black Lake, King M[oun]t[ain], Gatineau Prov[incial] P[ar]k [Gatineau Park, 45°34'N 75°57'W; LEM]. Frelighsburg [45°03'N 72°50'W; UL]. Gracefield [46°06'N 76°03'W; CNC]. Kingsmere [Gatineau Park, 45°34'N 75°57'W; CNC]. Kirks [Kirk's] Ferry [45°32'30"N 75°49'00"W; CNC]. Knowlton [45°13'02"N 72°31'01"W; CNC]. Lac Mondor, S[ain]te Flor[e] [Lac-Mondor, Sainte-Flore, 46°37'32"N 72°45'52"W; CNC]. Lakefield [45°45'N 74°15'W; LEM]. Lanoraie [45°58'N 73°13'W; LEM]. La Trappe [Oka, 45°29'41"N 74°01'30"W; UdeM]. Laval [45°35'N 73°45'W; LEM]. Luskville, Belisle Beach [45°32'N 76°01'W; CNC]. Montfort, Laurentian M[oun]t[ain]s [45°53'10"N 74°20'23"W; CU]. Mont S[ain]t Hilaire [Saint-Hilaire, 45°33'30"N 73°11'54"W; LEM]. Parc du Mont Tremblant, site 11 [Mont-Tremblant, Parc national du, 46°26'N 74°21'W; UdeM]. S[ain]te Anne de Bellevue / Morgan Arboretum [Sainte-Anne-de-Bellevue, 45°24'11"N 73°56'58"W; LEM]. S[ain]te Clotilde [Sainte-Clotilde-de-Châteauguay, 45°09'29"N 73°40'42"W; SJRS]. Sherbrooke [45°24'N 71°54'W; CRFL, CU]. Tadoussac [48°09'N 69°43'W; LEM].

*Meleoma signoretti* has been found in all provinces of Canada except New Brunswick, Newfoundland and Labrador, Prince Edward Island, and Saskatchewan. Other names in literature for this insect in Canada, are: *Meleoma emuncta* (Tauber 1969<sup>220</sup>). All Canadian localities reported in literature have been authenticated. All specimens reported here are documented with data in Garland (1982, 2000), or as new and corrected records (above). Based on label data, adults have been taken at light, and in Malaise trap; they have been associated with Spruce and Spruce-sand community; in one instance, an adult was reared from a larva found on: **BETULA**: Rocky Mountain House District BC [FIS 1943, BC-4380; CNC]. Bionomic notes on this species in literature pertaining to Canada have been summarised (Garland 1985a).

## GENUS *NINETA* Navás, 1912

*Nineta* Navás, 1912: 98. Type species: *Hemerobius flavus* Scopoli, 1763; original designation.

*Nineta* is Holarctic in distribution (New 2001), i.e., Asia, Europe, North Africa, North America (Brooks and Barnard 1990), with 17 described species and 1 undescribed species (Canard 2004). Larvae of the European species are naked; larvae of North American species are unknown (Monserrat *et al.* 2001). There are two species in western North America (Brooks and Barnard 1990; Penny *et al.* 1997); one of these occurs in Canada, as follows:

### *NINETA GRAVIDA* (Banks, 1911)

*Chrysopa grvida* Banks, 1911: 343. Type: USA: California (Yosemite [National Park]); original designation; male, MCZ No. 11384 (Garland 2001).

*Nineta grvida* (Banks, 1911): Garland 1984a: 94.

### SYNONYMY PERTAINING TO CANADA

*Chrysopa grvida*: Smith 1932: 597; Spencer 1942: 27; Garland 1979: 745–746.

*Nineta grvida*: Garland 1982 [1984]: 238–241, 407, Figs. 74, 99–104, Map 19; 1984: 94; 1985a: 737–751; Scudder

218. J.E.H. Martin, personal communication [1980].

219. Label data provided by L.L. Pechuman *in litt.* 1980; gender based on Tauber 1969: 33.

220. Tauber (1969: 24; as *Meleoma emuncta*) recorded one female from Kingsmere QC, and four females from Kirk's Ferry QC; corrected by Garland (1982 [1984]).

**CANADA: T = 9** (5♂, 2♀, 2?). **FIRST RECORD:** BC: 1 ? [abdomen missing], Vanc[ouver] Island, 2.vi.[18]88 (G.W. Taylor) [CNC]. **FLIGHT PERIOD:** June 2 (1888; Vancouver Island BC)–July 31 (1991; Upper Carmanah Valley [Vancouver Island] BC).

**BC: T = 9** (5♂, 2♀, 2?). **FIRST RECORD:** 1 ? [abdomen missing], Vanc[ouver] Island, 2.vi.[18]88 (G.W. Taylor) [CNC]. **NEW RECORDS:** 1♀, Chemainus, W[estern] Hemlock; 21.vi.1983 (FIS No. 83-455-04) / [type-written] (258) [collector unknown; PFRC]. 1♂, Upper Carmanah Valley, Station 4; 2.vii.1990 (N.N. Winchester) / *Nineta gravida*, det. Penny, '95 [UCBRK<sup>221</sup>]. 1♂, Upper Carmanah Valley, Malaise Trap 2; 2.vii.1990 (N.N. Winchester) / *Nineta gravida*, det. Penny, '95 [UCBRK<sup>222</sup>]. 2♂, Upper Carmanah Valley, UTM: 10U CJ 803006; TZMT5; 31.vii–11.viii.1991<sup>223</sup> (N. Winchester) / *Nineta gravida*, det. Penny, '95 [UCBRK<sup>224</sup>]. **FLIGHT PERIOD:** June 2 (1888; Vancouver Island)–July 31 (1991; Upper Carmanah Valley). **LOCALITIES:** Chemainus [48°55'N 123°43'W; PFRC]. Departure Bay [49°12'N 123°58'W; CNC]. Gabriola Island [49°10'N 123°48'W; SEM]. Upper Carmanah Valley, UTM: 10U CJ 803006<sup>225</sup> / Upper Carmanah Valley, Station 4 / Upper Carmanah Valley, Malaise Trap 2 [Carmanah Walbran Park, Renfrew Land District, 48°39'N 124°39'W; UCBRK]. Vanc[ouver] Island [CNC]. Victoria, Geo[logical] Surv[ey], Canada [48°26'N 123°22'W; CNC].

*Nineta gravida* occurs in Canada, in southern coastal British Columbia. All Canadian localities reported in literature have been authenticated. All specimens reported here are documented with data in Garland (1982, 2000, 2001), or as new records (above). Based on label data, adults have been taken in Malaise trap, and they have been associated with Western Hemlock [*Tsuga heterophylla*]. The gut of the male specimen from Gabriola Island contained tri-lobed yellow pollen typical of Pinaceae, and much fragmented fungi (Garland 2001). The newly recorded female reported here from Chemainus BC also was examined for gut contents, but there was nothing to report. This is one of five species of Chrysopidae that have been designated as potentially rare and endangered in British Columbia (Scudder 1994).

#### SUBFAMILY *NOTHOCHRYSIDAE* Navás, 1910

*Notochrysinos* Navás, 1910: 59. Type genus: *Nothochrysa* MacLachlan, 1868: 195.

*Nothochrysinæ* Navás, 1910: Adams 1967: 219.

This subfamily, regarded as the most primitive of the Recent Chrysopidae, contains nine genera (New 2001). One genus occurs in Canada, as follows:

#### GENUS *NOTHOCHRYSA* MacLachlan, 1868

*Nothochrysa* MacLachlan, 1868: 195, 207–208. Type species: *Chrysopa fulviceps* Stephens, 1836; subsequent designation (Banks 1903: 142).

*Nothochrysa* is represented by three species worldwide: two Palaearctic, and one Nearctic, in western Canada and the USA (Brooks and Barnard 1990). The species in Canada is, as follows:

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221. Label data provided by C.A. Tauber *in litt.* 2006.

222. Label data provided by C.A. Tauber *in litt.* 2006.

223. The now-accepted convention is to date the specimen from the first trapping day, i.e., July 31.

224. Label data provided by C.A. Tauber *in litt.* 2006.

225. UTM 10U CJ803006: The stated geographic co-ordinate in this reference for Vancouver Island, British Columbia, Canada, is neither complete nor correct. Zone number 10 is fine for Vancouver Island, but the sequence following the zone number is here questioned because the geographic co-ordinate requires two values, described as an Easting and a Northing.

## ***NOTHOCHRYSA CALIFORNICA* Banks, 1892**

*Nothochrysa californica* Banks, 1892: 373. Type: USA: S. California (corrected by Banks 1903: 142); original designation; male, Los Angeles CA, MCZ (Penny *et al.* 1997).

### **SYNONYMY PERTAINING TO CANADA**

*Nothochrysa californica*: Smith 1932: 582, 601; Spencer 1942: 26; Bickley and MacLeod 1956: 183; Adams 1967: 223–225; Garland 1982 [1984]: 265–267, 410, Figs. 74, 128–132, Map 24; 1984: 94; 1985a: 737–751; Scudder 1994: 45; Penny *et al.* 1997: 44.

**CANADA: T = 9** (5♂, 4♀). **FIRST RECORD:** BC: 1♂, Sidney, 11.iv.1927 (W. Downes) [SEM]. **FLIGHT PERIOD:** April 11 (1927; Sidney BC)–June 5 (1955; Bowser BC).

**BC: T = 9** (5♂, 4♀). **FIRST RECORD:** 1♂, Sidney, 11.iv.1927 (W. Downes) [SEM]. **FLIGHT PERIOD:** April 11 (1927; Sidney)–June 5 (1955; Bowser). **LOCALITIES:** Bowser [49°26'N 124°40'W; CNC]. Sidney [48°39'N 123°24'W; SEM]. S[outh] Pender Is[land] [48°45'N 123°13'W; CNC]. Vancouver, Seymour Mountain, 4700 ft [1433 m] [Mount Seymour Provincial Park, 49°23'30"N 122°55'00"W; SEM]. Victoria [48°26'N 123°22'W; SEM].

*Nothochrysa californica* occurs in Canada, in southern coastal British Columbia. Canadian localities in literature for which no specimen has been seen, are: Nanaimo BC (Spencer 1942). Smith (1932: 582), in his study of Chrysopidae in the Canadian National Collection, reported that, “Only a single specimen of this handsome species has been seen from Canada. It was collected by W.B. Anderson, Victoria, B.C., May 4, 1918. The specimen was badly damaged by museum pests and has been mounted on a slide (Fig. 5). It was compared with Banks’ type in the Museum of Comparative Zoology.” Although this particular specimen could not be located<sup>226</sup>, Victoria BC has been authenticated by other museum specimens [SEM]. All specimens reported here are documented with data in Garland (1982 [1984]). Based on label data, adults have been found on snow, and associated with D[ouglas] Fir [*Pseudotsuga menziesii*]. This is one of five species of Chrysopidae that have been designated as potentially rare and endangered in British Columbia (Scudder 1994). For the biology and immature stages of this species in California, see Toschi (1965).

### **Concluding remarks**

This study examined a total of 6,538 museum specimens of Chrysopidae from Canada and Alaska (6,497 adults, 41 larvae), comprising 24 species in two subfamilies (Table 1). The geographic distribution is provided for each species for each province or territory where the species occurs (Table 2). Total species numbers, in descending order, are as follows: CANADA: British Columbia (18), Ontario (13), Quebec (12), Nova Scotia (10), Alberta (9), Manitoba (9), Saskatchewan (8), New Brunswick (6), Newfoundland & Labrador (4), Prince Edward Island (4), Northwest Territories (3), Yukon (3), Nunavut (1); USA: Alaska (3). In Canada, some of the species are trans-continental, or apparently so, and one of them, *Chrysoperla carnea* s.l., extends to the Arctic Ocean in the Territory of Nunavut. Range extensions reported here for the first time include: *Chrysopa quadripunctata*, from southeastern Manitoba; *Chrysoperla rufilabris*, from southwestern Manitoba; and *Meleoma emuncta*, from northeastern Saskatchewan and northern Alberta—the best evidence yet of a boreal, trans-continental distribution for that species in Canada (*cf.* Tauber 1969). These range extensions were anticipated by Garland (1985a); however, in these cases, it took several decades for the relevant specimens to reach a museum where they would be available for study. For some species, geographic distribution is still poorly documented. Nevertheless, on present evidence, the chrysopid fauna of Canada and Alaska appears to be

226. In addition to the Canadian National Collection [CNC] (Dr. J.T. Troubridge), search for this slide-mounted specimen extended to the Spencer Entomological Museum [SEM] (Ms. K.M. Needham), and the Royal British Columbia Museum [BCPM] (Dr. R.A. Cannings).



endemic to the areas where the species occur. British Columbia, with 18 species, has the highest chrysopid diversity of any part of Canada. Indeed, among the 24 species of Chrysopidae in Canada and Alaska, eight can be found only in the Province of British Columbia, and five of these have been designated as potentially rare and endangered there (Scudder 1994).

**TABLE 1.** Chrysopidae of Canada and Alaska, specimens examined: adults + (larvae).

Species	Canada	Alaska
<i>Ceraeochrysa lineaticornis</i>	38	0
<i>Chrysopa chi</i>	608	6
<i>Chrysopa coloradensis</i>	123	0
<i>Chrysopa excepta</i>	11	0
<i>Chrysopa nigricornis</i>	267	0
<i>Chrysopa oculata</i>	2681 + (2)	4
<i>Chrysopa pleuralis</i>	31	0
<i>Chrysopa quadripunctata</i>	74 + (10)	0
<i>Chrysoperla carnea s.l.</i>	1748 + (29)	83
<i>Chrysoperla harrisii</i>	248	0
<i>Chrysoperla rufilabris</i>	41	0
<i>Chrysopodes (Neosuarius) placita</i>	3	0
<i>Dichochrysa macleodi</i>	4	0
<i>Dichochrysa perfecta</i>	18	0
<i>Eremochrysa (Chrysopiella) brevisetosa</i>	1	0
<i>Eremochrysa (Eremochrysa) canadensis</i>	4	0
<i>Eremochrysa (Eremochrysa) fraterna</i>	13	0
<i>Eremochrysa (Eremochrysa) punctinervis</i>	36	0
<i>Meleoma dolicharthra</i>	18	0
<i>Meleoma emuncta</i>	305	0
<i>Meleoma schwarzi</i>	3	0
<i>Meleoma signoretti</i>	111	0
<i>Nineta gravida</i>	9	0
<i>Nothochrysa californica</i>	9	0
Total (6538)	6404 + (41)	93

The first authenticated records are summarised for each species in Canada (Table 3), and Alaska (Table 4). The number of first records by province is as follows: British Columbia (15), Ontario (5), Quebec (2), Alberta (1), and Nova Scotia (1). The earliest authenticated record for any species of Chrysopidae from Canada is a specimen of *Chrysopa nigricornis* collected by H.H. Lyman in 1876 at Montreal QC; for Alaska, it is two specimens (same data) of *Chrysoperla carnea s.l.* collected by J.M. Aldrich in 1921 at Fairbanks.

Flight periods are provided for each species in Canada (Table 5), and Alaska (Table 6). Apparent flight periods for some species may conceal overlapping generations; however, only the genus *Chrysoperla* overwinters as adults. This accounts for the extended flight period for such species as *C. carnea s.l.*, for which museum specimens exist for all months of the year, and which has been reported as active throughout the winter at Vancouver BC (Foster 1942, as *Chrysopa harrisii*).

**TABLE 2.** Chrysopidae of Canada by province and territory, and Alaska (arranged alphabetically).

Species	Canada													USA	
	AB	BC	MB	NB	NL	NS	NT	NU	ON	PE	QC	SK	YK	AK	
<i>Ceraeochrysa lineaticornis</i>				NB		NS			ON		QC	SK			
<i>Chrysopa chi</i>	AB	BC	MB	NB	NL	NS	NT		ON	PE	QC	SK	YK	AK	
<i>Chrysopa coloradensis</i>		BC													
<i>Chrysopa excepta</i>	AB	BC										SK			
<i>Chrysopa nigricornis</i>	AB	BC	MB	NB		NS			ON		QC	SK			
<i>Chrysopa oculata</i>	AB	BC	MB	NB	NL	NS	NT		ON	PE	QC	SK	YK	AK	
<i>Chrysopa pleuralis</i>	AB	BC													
<i>Chrysopa quadripunctata</i>		BC	MB			NS			ON	PE	QC	SK			
<i>Chrysoperla carnea s.l.</i>	AB	BC	MB	NB	NL	NS	NT	NU	ON		QC	SK	YK	AK	
<i>Chrysoperla harrisii</i>			MB			NS			ON		QC				
<i>Chrysoperla rufilabris</i>			MB			NS			ON		QC				
<i>Chrysopodes (N.) placita</i>									ON		QC				
<i>Dichochrysa macleodi</i>									ON						
<i>Dichochrysa perfecta</i>		BC													
<i>Eremochrysa (C.) brevisetosa</i>	AB														
<i>Eremochrysa (E.) canadensis</i>		BC							ON		QC				
<i>Eremochrysa (E.) fraterna</i>		BC													
<i>Eremochrysa (E.) punctinervis</i>		BC													
<i>Meleoma dolicharthra</i>		BC													
<i>Meleoma emuncta</i>	AB	BC	MB	NB	NL	NS			ON	PE	QC	SK			
<i>Meleoma schwarzi</i>		BC													
<i>Meleoma signoretti</i>	AB	BC	MB			NS			ON		QC				
<i>Nineta gravida</i>		BC													
<i>Nothochrysa californica</i>		BC													
TOTALS(24)	9	18	9	6	4	10	3	1	13	4	12	8	3	3	

Among the interceptions reported here (Table 7), only *Chrysopa oculata* could be authenticated. This species is native to North America, not Europe, so it must have entered the aircraft before the overseas portion of the flight began. For all other interceptions, no specimens could be located. The use of chrysopids as biological control agents particularly in protected environments, means that they can be anticipated on imported fruits, vegetables, and plant materials.

Nomenclatural changes arising from this study include: *Mallada slossonae* Garland, 1996, here reported as a new synonym of *Dichochrysa macleodi* (Adams and Garland, 1983) **syn. nov.**; and *Dichochrysa perfecta* (Banks, 1895), as an **emendation**.

**TABLE 3.** Chrysopidae of Canada: first records.

Species	First record
<i>Ceraeochrysa lineaticornis</i>	NS: 2♀, Bridgetown, 31.vii.[19]12 (G.E.S[hewell]) [CNC]
<i>Chrysopa chi</i>	BC: 1♂, Vanc. Island, 2.vi.[18]88 (G.W. Taylor) [CNC]
<i>Chrysopa coloradensis</i>	BC: 1♀, Kaslo, 17.vii.[19]03 (R.P. Currie) [USNM]
<i>Chrysopa excepta</i>	BC: 1♀, Penticton, 7.vi.1919 (W.B. Anderson) [CNC]
<i>Chrysopa nigricornis</i>	QC: 1♂, Montreal, 21.vi.1875 (H.H. Lyman) [LEM] <sup>230a</sup>
<i>Chrysopa oculata</i>	BC: 1♀, Wellington, 6.viii.1897 [collector unknown; MCZ]
<i>Chrysopa pleuralis</i>	BC: 1♀, Ainsworth, 11.vii.1903 (R.P. Currie) [USNM]
<i>Chrysopa quadripunctata</i>	BC: 1♂, Vanc. Island, 2.vi.[18]88 (G.W. Taylor) [CNC]
<i>Chrysoperla carnea s.l.</i>	BC: 2♂, Wellington, 14.v.1897 [collector unknown; MCZ]
<i>Chrysoperla harrisii</i>	ON: 1♂, CEF, from Pine, emerg. 16.viii.[19]11 [collector unknown; CNC]
<i>Chrysoperla rufilabris</i>	ON: 1♀, Toronto, 14.vii.1914 (E.M. Walker) [ROM]
<i>Chrysopodes (N.) placita</i>	QC: 1♂, 1♀, Kazabazua, 16.viii.1927 (G.S. Walley) [CNC]
<i>Dichochrysa macleodi</i>	ON: 1♀, White Lake, uvl, 4.viii.1966 (P.D. Hebert) [ROM]
<i>Dichochrysa perfecta</i>	BC: 1♀, W. Summerland, 26.vii.1963 (G.J. Spencer) [SEM]
<i>Eremochrysa (C.) brevisetosa</i>	AB: 1♂, Drumheller, 14.vi.1946 (E.H. Strickland) [UAE]
<i>Eremochrysa (E.) canadensis</i>	ON: 1♀, Go Home, 13.vii.1907 [collector unknown; MCZ]
<i>Eremochrysa (E.) fraterna</i>	BC: 2♀, Seton Lake, Lillooet, 28.v.1926 (J.McDunnough) [CNC]
<i>Eremochrysa (E.) punctinervis</i>	BC: 1♀, Oliver, 23.v.1923 (C.B. Garrett) [CNC]
<i>Meleoma dolicharthra</i>	BC: 1♂, 1♀, Kaslo, 24.vi.[1903] (R.P. Currie) [USNM]
<i>Meleoma emuncta</i>	BC: 1♀, Kaslo, 8.vii.[1903] (R.P. Currie) [USNM]
<i>Meleoma schwarzi</i>	BC: 1♂, Penticton, 2800-3000 ft, 13.vi.1977 (J.A. Garland) [LEM]
<i>Meleoma signoretti</i>	ON: 1♀, Toronto, 6.viii.1914 (E.M. Walker) [ROM]
<i>Nineta grvida</i>	BC: 1♀ [abdomen missing], Vanc[ouver] Island, 2.vi.[18]88 (G.W. Taylor) [CNC]
<i>Nothochrysa californica</i>	BC: 1♂, Sidney, 11.iv.1927 (W. Downes) [SEM]

a. <sup>230</sup>This is the earliest definitely dated specimen of Chrysopidae from Canada; reported erroneously as *Chrysopa oculata* by Garland (1985a: 746).

**TABLE 4.** Chrysopidae of Alaska: first records.

Species	First record
<i>Chrysopa chi</i>	1♂, 1♀, Richard. Hwy., mile 290, 19.vi.1951 (Mason & McGillis) [CNC]
<i>Chrysopa oculata</i>	1♀, Richard. Hwy., mile 315, 8.vi.1951 (J.R. McGillis) [CNC]
<i>Chrysoperla carnea s.l.</i>	2♀, Fairbanks, 2.vii.1921 (J.M. Aldrich) [USNM]

Recent species have been described within the genus *Chrysoperla* based on vibrational mating songs (Henry 1993; Henry *et al.* 1993). These species are widely acknowledged to be morphologically indistinguishable from other species in the *carnea*-group, and interbreeding in captivity also is said to occur (Brooks 1994; Henry *et al.* 2002; Henry and Wells 2004). The song-morphs in the contiguous United States have been extrapolated into Canada (Henry 1985; Henry and Wells 2004), but the technique has not been applied specifically to populations in Canada (Henry *et al.* 1999). The procedure requires living specimens (Henry *et al.* 1999, 2001), which makes it unsuitable for the study of preserved, museum specimens. A further challenge is encountered in populations of *Chrysoperla carnea s.l.* from Alaska and the northern part of Canada, south to

about Whitehorse YK, which are univoltine in the wild and smaller than specimens from southern populations (C.A. Tauber and Tauber 1982; Garland 1985a, 1989)—yet the smallest specimen so far examined was from Winslow BC (Garland 1982 [1984]). Clearly there is need for a more objective, non-behavioural technique to identify museum specimens within the Chrysopidae, as in other areas of zoology (Balakrishnan 2005). The procedure of barcoding offers promise (Hebert *et al.* 2003; Rubinoff and Holland 2005). This is an active area of research which, if applied to the genus *Chrysoperla* and the *carnea*-group in particular, could be helpful because species of this genus figure prominently in biological control, not only in North America but also in other parts of the world (McEwen *et al.* 2001).

There still is much to learn about the Chrysopidae of Canada and Alaska, and it is expected that future research and inventory activity will cause the classification presented here to be further modified. It is hoped that the revised checklist and geo-referenced localities provided here will serve as a foundation for the study of the Chrysopidae in Canada and Alaska with impending climate change, and that persons who would employ Chrysopidae as biological control agents may better know their own resources.

**TABLE 5.** Chrysopidae of Canada: flight periods.

Species	Flight period
<i>Ceraeochrysa lineaticornis</i>	May 20 (1951; Lac-Mondor QC)—September 7 (1950; Mount Uniacke NS)
<i>Chrysopa chi</i>	May 14 (1926; Agassiz BC)—September 25 (1923; Edmonton AB)
<i>Chrysopa coloradensis</i>	May 12 (1980; Kamloops BC)—September 18 (1976; Penticton BC)
<i>Chrysopa excepta</i>	May 24 (1922; Nicola BC)—August 1 (1951; Elbow SK)
<i>Chrysopa nigricornis</i>	May 9 (1921; Victoria BC)—October 24 (1951; Montreal QC)
<i>Chrysopa oculata</i>	May 3 (1923; Oliver BC)—October 30 (1956; Tews Falls ON)
<i>Chrysopa pleuralis</i>	June 14 (1938; Clinton BC)—August 14 (1922; Banff AB)
<i>Chrysopa quadripunctata</i>	May 26 (1965; Rondeau Provincial Park ON)—September 22 (1961; Ste-Anne-de-Bellevue QC)
<i>Chrysoperla carnea s.l.</i>	April 4 (1976; Penticton BC)—November 30 (1938; Vancouver BC)
<i>Chrysoperla harrisii</i>	May 18 (1974; Dunnville ON)—October 1 (1976; Saint Lawrence Islands National Park, Thwartway Island ON)
<i>Chrysoperla rufilabris</i>	June 9 (1965; Rondeau Provincial Park ON)—September 16 (1931; Biscotasing ON)
<i>Chrysopodes (N.) placita</i>	August 7 (1968; Chatterton ON)—August 16 (1927; Kazabazua QC)
<i>Dichochrysa macleodi</i>	July 3 (1977; The Pinery Provincial Park ON)—August 4 (1966; White Lake ON)
<i>Dichochrysa perfecta</i>	July 19 (1989; Oliver BC)—September 3 (1976; Penticton BC)
<i>Eremochrysa (C.) brevisetosa</i>	June 14 (1946; Drumheller AB)
<i>Eremochrysa (E.) canadensis</i>	July 13 (1907; Go Home ON)—August 2 (1956; Magnetawan ON)
<i>Eremochrysa (E.) fraterna</i>	May 15 (1959; Vaseux Lake BC)—August 13 (1986; Penticton BC)
<i>Eremochrysa (E.) punctinervis</i>	May 23 (1923; Oliver BC)—September 4 (1976; Penticton BC)
<i>Meleoma dolicharthra</i>	April 30 (1931; Langley BC)—September 11 (1962; Victoria BC)
<i>Meleoma emuncta</i>	May 10 (1916; Victoria BC)—November 4 (1972; Sherbrooke QC)
<i>Meleoma schwarzi</i>	June 13 (1977; Penticton BC)—June 20 (1977; Penticton BC)
<i>Meleoma signoretti</i>	May 30 (1962; Toronto ON)—September 10 (1950; Kirk's Ferry QC)
<i>Nineta gravida</i>	June 2 (1888; Vancouver Island BC)—July 31 (1991; Upper Carmanah Valley BC)
<i>Nothochrysa californica</i>	April 11 (1927; Sidney BC)—June 5 (1955; Bowser BC)



**TABLE 6.** Chrysopidae of Alaska: flight periods.

Species	Flight period
<i>Chrysopa chi</i>	June 19 (1951; Richardson Highway, mile 290)–June 26 (1979; Fairbanks)
<i>Chrysopa oculata</i>	June 8 (1951; Richardson Highway, mile 315)–June 26 (1979; Fairbanks)
<i>Chrysoperla carnea s.l.</i>	May 8 (1976; Goldstream Valley, 9 miles NW of Fairbanks)–August 13 (1972; Fairbanks)

**TABLE 7.** Chrysopidae intercepted in Canada.

Species	Records
Chrysopidae [not here examined]	<p>1985/86, Transported in Passenger Baggage; Province of Entry = ON; Host/carrier = <i>Malus</i>, consumption [fruit]; Country of Origin = Greece; Garland (1988a, as Chrysopidae sp.).</p> <p>1985/86, Transport unspecified; Province of Entry = SK; Host/carrier = <i>Borago officinalis</i>, propagation [plant material]; Country of Origin = Netherlands; Garland (1988a, as Chrysopidae sp.).</p> <p>1985/86, Transported in Passenger Baggage; Province of Entry = BC; Host/carrier = <i>Pinus</i> [probably pine cones]; Country of Origin = USA; Garland (1988a, as <i>Chrysopa</i> sp.).</p> <p>1986/87, Transported in Cargo; Province of Entry = QC; Host/carrier = <i>Malus</i>, consumption [fruit]; Country of Origin = France; Garland (1988b, as Chrysopidae sp.).</p> <p>1986/87, Transported in Cargo; Province of Entry = BC; Host/carrier = <i>Prunus domestica</i>, consumption [fruit]; Country of Origin = California [USA]; Garland (1988b, as Chrysopidae sp.).</p> <p>1990/91, Transported in Cargo; Province of Entry = BC; Host/carrier = nursery stock, propagation; Country of Origin = Netherlands; Miller (1991, as Chrysopidae sp.).</p> <p>1993/94; Province of Entry = QC; Host/carrier = container; Country of Origin = England [United Kingdom]; Gill <i>et al.</i> (1994, as <i>Chrysoperla carnea</i>).</p> <p>1993/94; Province of Entry = QC; Host/carrier = military vehicle; Country of Origin = France; Gill <i>et al.</i> (1994, as <i>Chrysoperla</i> sp.).</p> <p>1997/98; Province of Entry = BC; Host/carrier = <i>Pyrus</i>, consumption [fruit]; Country of Origin = South Korea [Korea Republic]; Gill <i>et al.</i> (2001, as Chrysopidae sp.).</p> <p>1997/98; Province of Entry = NS; Host/carrier = container [plant]; Country of Origin = Holland [Netherlands]; Gill <i>et al.</i> (2001, as <i>Chrysopa</i> sp.).</p>
<i>Chrysopa oculata</i>	<p>1♀, TCA [Trans Canada Airlines] Flight 857, London Eng[land] &amp; Prestwick Scot[land] - [to] Toronto, 12.viii.[19]61 [collector unknown] [CNC].</p>

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## References

- Adams, P.A. (1962) A stridulatory structure in Chrysopidae (Neuroptera). *Pan-Pacific Entomologist*, 38, 178–180.
- Adams, P.A. (1967) A review of the Mesochrysinæ and Nothochrysinæ (Neuroptera: Chrysopidae). *Bulletin of the Museum of Comparative Zoology*, 135, 215–238.
- Adams, P.A. (1969) New species and synonymy in the genus *Meleoma* (Neuroptera: Chrysopidae), with a discussion of genitalic homologies. *Postilla*, 136, 18 pp.
- Adams, P.A. (1982) *Ceraeochrysa*, a new genus of *Chrysopinae* (Neuroptera). (Studies in New World Chrysopidae, Part II). *Neuroptera International*, 2, 69–75.
- Adams, P.A. & Garland, J.A. (1981) A new species of *Chrysopiella* Banks from western North America (Neuroptera: Chrysopidae). *The Canadian Entomologist*, 113, 1–4.
- Adams, P.A. & Garland, J.A. (1983) A review of the genus *Mallada* in the United States and Canada, with a new species (Neuroptera: Chrysopidae). *Psyche*, 89 (1982), 239–248. [Vol. 89, nos. 3–4, for 1982, mailed April 27, 1983]
- Adams, P.A. & Penny, N.D. (1987) Neuroptera of the Amazon Basin, Part Iia. Introduction and Chrysopini. *Acta Amazonica*, 15, 413–479.
- Albuquerque, G.S., Tauber, M.J., & Tauber, C.A. (1997) Life-history adaptations and reproductive costs associated with specialization in predacious insects. *Journal of Animal Ecology*, 66, 307–317.
- Anonymous. (1906) The British Columbia list. *Bulletin of the British Columbia Entomological Society*, 4, 1–4.
- Anonymous. (1978) Collections of Canadian Insects and Certain Related Groups, 1978. Pilot Study for a Biological Survey of the Insects of Canada. *Bulletin of the Entomological Society of Canada*, 10 (1), Supplement, 1–21.
- Aspöck, H., Hölzel, H., & Aspöck, U. (2001) Kommentierter Katalog der Neuropterida (Insecta: Raphidioptera, Megaloptera, Neuroptera) der Westpaläarkt. *Denisia*, 2, 1–612.
- Balakrishnan, R. (2005) Species concepts, species boundaries and species identification: A view from the Tropics. *Systematic Entomology*, 54, 689–693.
- Banks, N. (1892) A synopsis, catalogue, and bibliography of the neuropteroid insects of temperate North America. *Transactions of the American Entomological Society*, 19, 327–373.
- Banks, N. (1895a) New Neuropteroid insects. *Transactions of the American Entomological Society*, 22, 313–316.
- Banks, N. (1895b) Some Mexican Neuroptera. *Proceedings of the California Academy of Sciences, Series 2*. 5 (1), 515–522.
- Banks, N. (1896) A new species of *Meleoma*. *Entomological News*, 7, 95–96.
- Banks, N. (1898) Three new species of Chrysopidae. *Proceedings of the Entomological Society of Washington*, 4 (1897), 173–175. [Date of issue of Vol. IV, No. 2 (pp. 49–176), March 21, 1898]
- Banks, N. (1903) A revision of the Nearctic Chrysopidae. *Transactions of the American Entomological Society*, 29, 137–162, pl. II.
- Banks, N. (1908) Neuropteroid insects—Notes and descriptions. *Transactions of the American Entomological Society*, 34, 255–268, pl. XVII–XIX.
- Banks, N. (1911) Descriptions of new species of North American Neuropteroid insects. *Transactions of the American Entomological Society*, 37, 335–360, pl. XI–XIII.
- Banks, N. (1924) Descriptions of new neuropteroid insects. *Bulletin of the Museum of Comparative Zoology*, 65, 421–455, 4 pls.
- Banks, N. (1938) New native Neuropteroid insects. *Psyche*, 45, 72–79.
- Banks, N. (1950) Notes and descriptions of western Chrysopidae (Neuroptera). *Psyche*, 57, 45–67.
- Barnard, P.C. (1978) A check-list of the British Neuroptera with taxonomic notes. *Entomologist's Gazette*, 29, 165–176.
- Bethune, C.J.S. (1914) Henry Herbert Lyman, MA. *The Canadian Entomologist*, 46, 221–226.
- Bickley, W.E. & MacLeod, E.G. (1956) A synopsis of the Nearctic Chrysopidae with a key to the genera. *Proceedings of the Entomological Society of Washington*, 58, 177–202.
- Bird, C.D., Hilchie, G.J., Kondla, N.G., Pike, E.M., & Sperling, F.A.H. (1995) *Alberta Butterflies*. The Provincial Museum of Alberta, Edmonton, Alberta. 349 pp.
- Bird, R.D. (1964) A history of agricultural entomology in Manitoba. *Proceedings of the Entomological Society of Manitoba*, 19 (1963), 7–11.

- Bram, R.A. & Bickley, W.E. (1963) The green lacewings of the genus *Chrysopa* in Maryland (Neuroptera: Chrysopidae). *Bulletin of the University of Maryland Agricultural Experiment Station*, A-124. 18 pp.
- Briand, L.J. (1931) Notes on *Chrysopa oculata* Say and its relation to the Oriental peach moth (*Laspeyresia molesta* Busck.) infestation in 1930. *The Canadian Entomologist*, 63, 123–126.
- Brodie, W. & White, J.E. (1883) *Label List of the Insects of the Dominion of Canada*. C.B. Robinson, Toronto. 1 p.
- Brooks, S.J. (1994) A taxonomic review of the common green lacewing genus *Chrysoperla* (Neuroptera: Chrysopidae). *Bulletin of the British Museum of Natural History (Entomology)*, 63, 137–210.
- Brooks, S.J. (1997) An overview of the current status of Chrysopidae (Neuroptera) systematics. *Deutsche Entomologische Zeitschrift*, 44, 267–275.
- Brooks, S.J. & Barnard, P.C. (1990) The green lacewings of the world: a generic review (Neuroptera: Chrysopidae). *Bulletin of the British Museum of Natural History (Entomology)*, 59, 117–286.
- Brown, A.W.A. (1934) A contribution to the insect fauna of Timagami. *The Canadian Entomologist*, 66, 206–211.
- Brown, N.R. & Clark, R.C. (1956) Studies of predators of the balsam woolly aphid, *Adelges piceae* (Ratz.) (Homoptera: Adelgidae). II. An annotated list of the predators associated with the balsam woolly aphid in eastern Canada. *The Canadian Entomologist*, 88, 678–683.
- Brown, W.J. (1934) The entomological record, 1931, 1932, 1933. *Report of the Quebec Society for Plant Protection 1932–1934*, 25–26, 140–162.
- Brown, W.J. (1956) The New World Species of *Chrysomela* L. (Coleoptera: Chrysomelidae). *The Canadian Entomologist*, 88 (Suppl. 3), 1–54.
- Bryant, D.G. (1958) *The Fiftieth Anniversary of the Faculty of Forestry at the University of New Brunswick, 1908–1958*. University of New Brunswick Forestry Association, Fredericton, New Brunswick. 155 pp.
- Bucher, G.E. & Bracken, G.K. (1978) Chrysopid predation on the bertha armyworm. *Manitoba Entomologist*, 10 (1976), 26–30.
- Burgess, L. (1980) Predation on adults of the flea beetle *Phyllotreta cruciferae* by lacewing larvae (Neuroptera: Chrysopidae). *The Canadian Entomologist*, 112, 745–746.
- Burmeister, H.C.C. (1839) *Handbuch der Entomologie*. T.C.F. Enslin, Berlin. 2 (2), 397–1050.
- Canard, M. (2004) World distribution of the genus *Nineta* Navas 1912 (Neuroptera: Chrysopidae), with some taxonomic notes. *Denisia*, 13, 153–161.
- Carpenter, G.D.H. (1938) Notes on insects collected in West Greenland by the Oxford University Greenland Expedition, 1936. *Annals and Magazine of Natural History, Series II*. 1, 529–553.
- Carpenter, M. (1945) Bibliography of biographies of Entomologists. *American Midland Naturalist*, 33, 1–116.
- Carpenter, M. (1962) Bibliography of biographies of Entomologists (Supplement). *American Midland Naturalist*, 50, 257–348.
- Currie, R.P. (1904) An insect-collecting trip to British Columbia. *Proceedings of the Entomological Society of Washington*, 6, 24–37.
- Danks, H.V. (Ed.). (1979) Canada and its insect fauna. *Memoirs of the Entomological Society of Canada*, 108, 1–573.
- Dennys, A.A. (1927) Some notes on the hibernating habits of insects in dry trees in the interior of B.C. *Proceedings of the Entomological Society of British Columbia*, 24, 19–25.
- Dong, K.Z., Li, W.Z., Cui, J.Z., & Yang, X.K. (2004) Three new species of *Dichochrysa* (Insecta: Neuroptera: Chrysopidae) from China, with a checklist of Chinese *Dichochrysa*. *The Raffles Bulletin of Zoology*, 52, 67–74.
- Dorokhova, G.I. (1979) The family Chrysopidae (Neuroptera) in the USSR. *Entomological Review (Washington DC)*, 58, 55–59.
- Downes, J.A. (1974) Sugar feeding by the larva of *Chrysopa* (Neuroptera). *The Canadian Entomologist*, 106, 121–125.
- Dustan, G.G. (1961) The Oriental fruit moth, *Grapholitha [sic] molesta* (Busck) (Lepidoptera: Olethreutidae) in Ontario. *Proceedings of the Entomological Society of Ontario*, 91 (1960), 215–227.
- Dutilly, A. (1946) A list of insects of the Mackenzie River Basin. *The Canadian Field-Naturalist*, 60, 35–44.
- Dyar, H.G. (1904) The Lepidoptera of the Kootenai District of British Columbia. *Proceedings of the United States National Museum*, 27, 779–938.
- Esben-Petersen, P. (1918) Neuroptera and Mecoptera. In: Results of Dr. E. Mjöberg's Swedish Expeditions to Australia 1910–1913. *Arkiv för Zoologi*, 11 (26), 1–37.
- Farrar, J.L. (1995) *Trees in Canada*. The Canadian Forest Service in cooperation with the Canada Communication Group, Publishing. Supply and Services Canada, Ottawa, Ontario. 502 pp.
- Ferguson, D.C. (1954) The Lepidoptera of Nova Scotia. Part 1, Macrolepidoptera. *Proceedings of the Nova Scotian Institute of Science*, 23 (3), 161–375.
- Fitch, A. (1855) Report upon the noxious and other insects of the State of New York. *Transactions of the New York State Agricultural Society*, 14, 705–880.
- Fitch, A. (1856) *First and Second Report on the Noxious, Beneficial and Other Insects, of the State of New York*. C. Van Benthuyssen, Albany, New York. 176 pp.
- Flint, O.S., Jr. (2002) List of the name-bearing Neuropterida Types in the collection of the National Museum of Natural History, Smithsonian Institution, USA. *Acta Zoologica Academiae Scientiarum Hungaricae*, 48 (Suppl. 2), 89–98.
- Fondren, K.M., McCullough, D.G., & Walter, A.J. (2004) Insect predators and augmentative biological control of balsam twig aphid (*Mindarus abietinus* Koch) (Homoptera: Aphididae) on Christmas Tree plantations. *Environmental Entomology*, 33, 1652–1661.
- Foster, R.E. (1942) Insects active throughout the winter at Vancouver, B.C. Part 1: Introduction and lists of the Coleoptera and Neuroptera. *Proceedings of the Entomological Society of British Columbia*, 38 (1941), 19–23.
- Frstrup, B. (1942) Neuroptera and Trichoptera. *Zoology of Iceland*, 3, 1–23.

- Fyles, T.W. (1903) Insect Life. *Annual Report of the Entomological Society of Ontario*, 33 (1902), 23–31.
- Garland, J.A. (1979) *Meleoma schwarzi*: An addition to the Canadian fauna (Neuropteroida Planipennia: Chrysopidae). *The Canadian Entomologist*, 111, 745–746.
- Garland, J.A. (1982) [1984]. *The Taxonomy of the Chrysopidae of Canada and Alaska (Insecta: Neuroptera)*. Ph.D. Thesis, McGill University, Ste-Anne-de-Bellevue, Quebec, Canada. 1, 418 pp., 2, 132 figures, 24 maps. National Library of Canada, Microform, ISBN: 0315101962.
- Garland, J.A. (1984) Catalogue of Chrysopidae of Canada and Alaska (Neuroptera). *Neuroptera International*, 3 (2), 93–94. [Legal Deposit: 1984]
- Garland, J.A. (1985a) Identification of Chrysopidae in Canada, with bionomic notes (Neuroptera). *The Canadian Entomologist*, 117, 737–762, 1278 (erratum).
- Garland, J.A. (1985b) Une nouvelle synonymie de *Ceraeochrysa placita* (Banks), espèce Nord-Américain, avec désignation d'un néo-type (Planipennia, Chrysopidae). *Neuroptera International*, 3 (3), 137–138. [Legal Deposit: 1985]
- Garland, J.A. (1985c) *Corrigenda*. *Neuroptera International* 3 (3), 149. [Legal Deposit: 1985]
- Garland, J.A. (Ed.). (1988a) *Intercepted Plant Pests, 1985–86 / Ravageurs interceptés, 1985–1986*. Agriculture Canada, Plant Health Division, Ottawa. 56 pp.
- Garland, J.A. (Ed.). (1988b) *Intercepted Plant Pests, 1986–87 / Ravageurs interceptés, 1986–1987*. Agriculture Canada, Plant Health Division, Ottawa. 56 pp.
- Garland, J.A. (1989) Phénologie de l'espèce holarctique *Chrysoperla carnea* (Stephens) (Neuroptera: Chrysopidae) dans la partie septentrionale de l'Amérique du Nord. *Neuroptera International*, 5, 181–183.
- Garland, J.A. (2000) The Chrysopidae of Canada (Neuroptera): recent acquisitions chiefly in British Columbia and Yukon. *Journal of the Entomological Society of British Columbia*, 97, 39–40.
- Garland, J.A. (2001) Rediscovery of *Nineta grvida* (Banks, 1911) in British Columbia and review of the genus *Nineta* Navás, 1912 in Canada (Neuroptera: Chrysopidae). *Journal of Neuropterology*, 3 (2000), 43–50.
- Garlick, W.G.P. (1955) Field studies of natural control of the codling moth, *Carpocapsa pomonella* (L.), and of the interrelated fauna in apple orchards in Ontario. *Annual Report of the Entomology Laboratory, Vineland Station, Canada Department of Agriculture*, 2 (1955), 265–391.
- Gibson, A. (1910) The entomological record, 1909. *Annual Report of the Entomological Society of Ontario*, 40 (1909), 110–128.
- Gibson, A. (1912) The entomological record, 1911. *Annual Report of the Entomological Society of Ontario*, 42 (1911), 89–112.
- Gibson, A. (1913) The entomological record, 1912. *Annual Report of the Entomological Society of Ontario*, 43 (1912), 113–140.
- Gibson, A. (1914) The entomological record, 1913. *Annual Report of the Entomological Society of Ontario*, 44 (1913), 106–129.
- Gibson, A. (1915) The entomological record, 1914. *Annual Report of the Entomological Society of Ontario*, 45 (1914), 123–150.
- Gibson, A. (1939) The Canadian Entomological Service. Fifty years of retrospect, 1887 to 1937. *VII Internationaler Kongress für Entomologie (Berlin)*, 3 (1938), 1429–1479.
- Gilbert, P. (1977) *A Compendium of the Biographical Literature on Deceased Entomologists*. British Museum (Natural History), London. Publication No. 786. 452 pp.
- Gill, B.D., Parker, D.J., Miller, Sylvia A., Phillippe, R.C., & White, G.P. (Eds.). (1994) *Intercepted Plant Pests / Phytoravageurs interceptés, 1991–1994*. Agriculture and Agri-Food Canada, Food Production and Inspection Branch, Ottawa. 119 pp.
- Gill, B.D., Parker, D.J., Miller, Sylvia A., Phillippe, R.C., & White, G.P. (Eds.). (2001) *Intercepted Plant Pests / Phytoravageurs interceptés, 1997–2000*. Canadian Food Inspection Agency, Nepean, Ontario. 152 pp.
- Gosse, P.H. (1840) [1971]. *The Canadian Naturalist. A series of conversations on the natural history of Lower Canada*. J. Van Voorst, London. xii + 372 pp. Facsimile reprint, Coles Publishing Co., Toronto.
- Grobler, J.H. (1962) The life history and ecology of the woolly pine needle aphid, *Schizolachnus pini-radiatae* (Davidson) (Homoptera: Aphididae). *The Canadian Entomologist*, 94, 35–45.
- Hagen, H. (1861) *Synopsis of the Neuroptera of North America, with a list of South American species*. Smithsonian Miscellaneous Collections, xx + 347 pp.
- Hagley, E.A.C. (1975) The arthropod fauna in unsprayed apple orchards in Ontario. II. Some predacious species. *Proceedings of the Entomological Society of Ontario*, 105 (1974), 28–40.
- Hagley, E.A.C. (1979) Integrated pest management-insecticides and natural predator populations on apple. *Proceedings of the Entomological Society of Ontario*, 109 (1978), 9–21.
- Hebert, P.D.N., Cywinska, A., Ball, S.L., & Waard, J.R.de. (2003) Biological identification through DNA barcodes. *Proceedings of the Royal Society, London, Section B*, 270, 313–321.
- Hemming, F. (Ed.). (1954) [March 8]. Opinion 211. Designation under the plenary powers, of a type species for the genera *Hemero-bius* Linnaeus, 1758, and *Chrysopa* Leach, 1815 (Class Insecta, Order Neuroptera) in harmony with accustomed usage. *Opinions and Declarations Rendered by the International Commission on Zoological Nomenclature*, 4 (1), 1–14.
- Henriksen, K.L. (1939) A revised index of the insects of Grønland. Neuroptera. *Meddelelser om Grønland*, 119 (10), 1–112.
- Henry, C.S. (1985) The proliferation of cryptic species in *Chrysoperla* green lacewings through song divergence. *Florida Entomologist*, 68, 18–38.
- Henry, C.S. (1993) *Chrysoperla johnsoni* (Neuroptera: Chrysopidae): Acoustic evidence for full species status. *Annals of the Entomological Society of America*, 86, 14–25.
- Henry, C.S. & Wells, M.L.M. (2004) Adaptation or random change? The evolutionary response of songs to substrate properties in lacewings (Neuroptera: Chrysopidae: *Chrysoperla*). *Animal Behaviour*, 68, 879–895.



- Henry, C.S., Wells, M.M.[sic], & Pupedis, R.J. (1993) Hidden taxonomic diversity within *Chrysoperla plorabunda* (Neuroptera: Chrysopidae): Two new species based on courtship songs. *Annals of the Entomological Society of America*, 86, 1–13.
- Henry, C.S., Wells, M.L.M., & Simon, C.M. (1999) Convergent evolution of courtship songs among cryptic species of the *carnea* group of green lacewings (Neuroptera: Chrysopidae: *Chrysoperla*). *Evolution*, 53, 1165–1179.
- Henry, C.S., Brooks, S.J., Thierry, D., Duelli, P., & Johnson, J.B. (2001) The common green lacewing (*Chrysoperla carnea* s. lat.) and the sibling species problem. In: McEwen, P.K., New, T.R., & Whittington, A.E. (Eds.). (2001) *Lacewings in the Crop Environment*. Cambridge University Press, 29–42.
- Henry, C.S., Brooks, S.J., Duelli, P., & Johnson, J.B. (2002) Discovering the true *Chrysoperla carnea* (Insecta: Neuroptera: Chrysopidae) using song analysis, morphology, and ecology. *Annals of the Entomological Society of America*, 95, 172–191.
- Herne, D.H.C. & Putman, W.L. (1966) Toxicity of some pesticides to predacious arthropods in Ontario peach orchards. *The Canadian Entomologist*, 98, 936–942.
- Hewitt, C.G. (1912) *The control of insect pests in Canada*. Dominion of Canada, Department of Agriculture, Division of Entomology. Experimental Farms, Bulletin No. 4 (Bulletin No. 9 – Series 2). 13 pp.
- Holliday, N.J. (2005) Norman Criddle: Pioneer Entomologist of the prairies. 2004 Heritage Lecture. *Bulletin of the Entomological Society of Canada*, 37 (2), 10–19.
- Howden, H.F. (1970) Coleoptera. In: Fauna of Sable Island and its Zoogeographic Affinities-A Compendium. *National Museum of Natural Sciences of Canada, Publications in Zoology*, 4, 1–45.
- Hydorn, S.B. & Whitcomb, W.H. (1979) Effects of larval diet on *Chrysopa rufilabris*. *Florida Entomologist*, 62, 293–298.
- Johnson, E.A. (2000) Focus on Field Stations: Kananaskis Field Stations, University of Calgary. *Bulletin of the Ecological Society of America*, 81, 129–132.
- Judd, W.W. (1949) Emergence of the lacewing *Chrysopa harrisii* Fitch (Neuroptera) and three hymenopterous parasites from the cocoon. *Annals of the Entomological Society of America*, 42, 461–464.
- Judd, W.W. (1964) Insects and spiders from goldenrod galls of *Gnorimoschema gallaesolidaginis* Riley (Gelechiidae). *The Canadian Entomologist*, 96, 987–990.
- Judd, W.W. (1967) Insects and other arthropods from year-old galls caused by *Gnorimoschema gallaesolidaginis* Riley (Lepidoptera: Gelechiidae) on goldenrod. *Canadian Journal of Zoology*, 45, 49–56.
- Kevan, D.K. McE. (1979) Neuroptera. In: Danks, H.V. (Ed.). Canada and its insect fauna. *Memoirs of the Entomological Society of Canada*, 108, 354–356.
- Kimmins, D.E. (1940) Notes on some types of Chrysopidae (Neuroptera) in the British Museum collections. *Annals and Magazine of Natural History, Series 11*, 5, 442–449.
- Klassen, P., Westwood, A.R., Preston, W.B., & McKillop, W.B. (1989) *The Butterflies of Manitoba*. Manitoba Museum of Man and Nature, Winnipeg, Manitoba. 290 pp.
- Kluge, N.J. (2005) Metamorphosis and homology of mouthparts in Neuropteroidea (Hexapoda: Metabola), with remarks on systematics and nomenclature. *Russian Entomological Journal*, 14, 87–100.
- Krogerus, H. (1954) Investigations on the Lepidoptera of Newfoundland. I. Macrolepidoptera. *Acta Zoologica Fennica*, 82, 1–80.
- Lafrance, J. (1970a) *Insects collected in the organic soil area of Ste-Clotilde, south-western Québec, from 1965 to 1969*. Canada Department of Agriculture, St-Jean, Québec. Part 1, 45 pp. [Unnumbered Publication, Limited Edition].
- Lafrance, J. (1970b) *Insects collected in the organic soil area of Ste-Clotilde, south-western Québec, from 1965 to 1969*. Canada Department of Agriculture, St-Jean, Québec. Part 2, 62 pp. [Unnumbered Publication, Limited Edition].
- Langford, D. & Langford, S. (2002) *Cycling the Kettle Valley Railway*. Rocky Mountain Books, Calgary, Alberta. 3<sup>rd</sup> Edn. 256 pp.
- Langor, D.W. (2005) Grassland Project Action. Grassland Project Key Site 2005: Waterton Lakes National Park. *Arthropods of Canadian Grasslands, Newsletter* (Published by the Biological Survey of Canada (Terrestrial Arthropods), Canadian Museum of Nature, Ottawa, Ontario), 11, 1–2. Available from: <http://www.biology.ualberta.ca/bsc/english/newsletters.htm%grasslands> (October, 2006)
- Leach, W.E. (1815) Entomology. In: Brewster, D. (Ed.). *Edinburgh Encyclopedia*, 9 (1), 57–172.
- Leraut, P. (1991) Les *Chrysoperla* de la faune de France (Neur. Chrysopidae). *Entomologica Gallica*, 2, 75–81.
- Lindroth, C.H. (1957) *The faunal connections between Europe and North America*. John Wiley and Sons, Inc., New York; Almqvist and Wiksell, Stockholm. 344 pp.
- Lord, F.T. (1983) The development of Agricultural Entomology in Nova Scotia. *Proceedings of the Nova Scotia Institute of Science*, 33, 19–46.
- McEwen, P.K., New, T.R., & Whittington, A.E. (Editors). (2001) Lacewings in crops: towards the future. In: McEwen, P.K., New, T.R., & Whittington, A.E. (Eds.). *Lacewings in the Crop Environment*. Cambridge University Press, 521–522.
- MacLachlan, R.<sup>227</sup> (1868) A monograph of the British Neuroptera–Planipennia. *The Transactions of the Entomological Society of London*, Memoir 9, ix (errata et addenda), 145–224.
- MacLachlan, R.<sup>228</sup> (1869) New species, &c., of Hemerobiina; with synonymic notes (first series). *Entomologist's Monthly Magazine*, 6, 21–27.
- MacLachlan, R. (1875) Neuroptera s. str., Planipennia. In: Fedtschenko, A.P. (Ed.). *Reise in Turkestan*, 2, 1–24.
- MacLellan, C.R. (1986) *Advancing Agriculture: A History, Kentville Research Station 1911–1986*. Agriculture Canada, Research

227.McLachlan: here, the spelling employed in the original publication was ‘MacLachlan’.

228.McLachlan: here, the spelling employed in the original publication was ‘M’Lachlan’.

Branch. 185 pp.

- McMullen, R.D. (1971) *Psylla pyricola* Forster [sic], pear psylla (Hemiptera: Psyllidae). In: Biological control programmes against insects and weeds in Canada, 1959–1968. *Commonwealth Institute of Biological Control Technical Communication*, 4, 33–38.
- McMullen, R.D. & Jong, C. (1967a) New records and discussion of predators of the pear psylla, *Psylla pyricola* Forster, in British Columbia. *Proceedings of the Entomological Society of British Columbia*, 64, 35–40.
- McMullen, R.D. & Jong, C. (1967b) The influence of three insecticides on predation of the pear psylla, *Psylla pyricola*. *The Canadian Entomologist*, 99, 1292–1297.
- Madsen, B.J. & Morgan, C.V.G. (1975) Mites and insects collected from vineyards in the Okanagan and Similkameen Valleys, British Columbia. *Journal of the Entomological Society of British Columbia*, 72, 9–14.
- Maw, H.E.L., Footitt, R.G., Hamilton, K.G.A., & Scudder, G.G.E. (2000) *Checklist of the Hemiptera of Canada and Alaska*. NRC Research Press, Ottawa, Ontario. 220 pp.
- Miller, S.J. (Ed.). (1991) *Intercepted Plant Pests / Ravageurs interceptés, 1990–1991*. Agriculture Canada, Food Production and Inspection Branch, Ottawa. 61 pp.
- Monserat, V.J., Oswald, J.D., Tauber, C.A., & Diaz-Aranda, L.M. (2001) Recognition of larval Neuroptera. In: McEwen, P.K., New, T.R., & Whittington, A.E. (Eds.). (2001) *Lacewings in the Crop Environment*. Cambridge University Press, 43–81.
- Morgantini, L.E. (1995) *The Ya Ha Tinda. An ecological overview*. Wildlife Resources Consulting Ltd., Edmonton. A Report prepared for Parks Canada, Alberta Region, Calgary. Parts 1 and 2. 110 pp. Available from: [http://www.rr.ualberta.ca/research/wildlife\\_impacts/yaha/YAHATINDA\\_overview\\_part2.pdf](http://www.rr.ualberta.ca/research/wildlife_impacts/yaha/YAHATINDA_overview_part2.pdf) (October, 2006)
- Morris, R.F. (1980) *Butterflies and Moths of Newfoundland and Labrador. The Macrolepidoptera*. Agriculture Canada, Research Branch, St. John's West Research Station, Newfoundland. Publication 1691. 407 pp.
- Morton, A.S. (1937) *Under Western Skies, Being a series of pen-pictures of the Canadian West in early fur trade times*. Thomas Nelson and Sons Limited, Toronto. 232 pp.
- Navás, L. (1910) Crisópidos nuevos. *Brotéria, serie zoologica*, 9, 38–59.
- Navás, L. (1912) Crisópidos y hemeróbidos (ins. Neuroptera) nuevos ó críticos. *Brotéria, serie zoologica*, 10, 98–113.
- Navás, L. (1913) Les chrysopides (Ins. Névr.) du Musée de Londres. *Annales de la Société scientifique de Bruxelles*, Mémoire 37, 292–330.
- Navás, L. (1914) Les Chrysopides (Ins. Névr.) du Musée de Londres. *Annales de la Société scientifique de Bruxelles*, Mémoire 38 (1913), 73–114.
- Nichols, J.R., Tauber, M.J., & Tauber, C.A. (1987) Geographical variability in ecophysiological traits controlling dormancy in *Chrysopa oculata* (Neuroptera: Chrysopidae). *Journal of Insect Physiology*, 33, 627–633.
- Nel, A., Delclos, X., & Hutin, A. (2005) Mesozoic chrysopid-like Planipennia: a phylogenetic approach (Insecta: Neuroptera). *Annales de la Société Entomologique de France, (n.s.)*, 41, 29–69.
- New, T.R. (1975) The biology of Chrysopidae and Hemerobiidae (Neuroptera), with a reference to their usage as biocontrol agents: a review. *Transactions of the Royal Entomological Society*, 127, 115–140.
- New, T.R. (2001) Introduction to the systematics and distribution of Coniopterygidae, Hemerobiidae, and Chrysopidae used in pest management. In: McEwen, P.K., New, T.R., and Whittington, A.E. (Eds.). 2001. *Lacewings in the Crop Environment*. Cambridge University Press, 6–28.
- Newman, E. (1853) Proposed division of Neuroptera into two classes. *The Zoologist*, 11 (Appendix), clxxxi–cciv [181–204].
- Parfin, S.I. (1952) The Megaloptera and Neuroptera of Minnesota. *American Midland Naturalist*, 47, 421–434.
- Penny, N.D. (2006) Two new species of *Meleoma* (Neuroptera: Chrysopidae) from western North America, with a revised key to species. *Annals of the Entomological Society of America*, 99, 58–63.
- Penny, N.D., Adams, P.A., & Stange, L.A. (1997) Species catalog of the Neuroptera, Megaloptera, and Raphidioptera of America north of Mexico. *Proceedings of the California Academy of Sciences*, 50, 39–114.
- Penny, N.D., Tauber, C.A., & Leon, T.de. (2000) A new species of *Chrysopa* from western North America with a key to North American species (Neuroptera: Chrysopidae). *Annals of the Entomological Society of America*, 93, 776–784.
- Philogene, B.J.R. & Chang, J.F. (1979) New records of parasitic chalcidoids of pear psylla (Homoptera: Psyllidae) in Ontario, with observations on the current world status of its parasitoids and predators. *Proceedings of the Entomological Society of Ontario*, 109 (1978), 53–60.
- Place, I.C.M. (2002) *75 Years of Research in the Woods: A History of Petawawa Forest Experiment Station and Petawawa National Forestry Institute, 1918–1993*. General Store Publishing House, Burnstown, Ontario. 205 pp.
- Poole, R.W. & Gentili, P. (1996) *Nomina Insecta Nearctica: A Check List of the Insects of North America*. Entomological Information Services, Rockville, Maryland. 2, 793 pp.
- Prévost, Y.H. & Groot, P.de. (1993) *Entomology in Ontario*. The Entomological Society of Ontario. 2<sup>nd</sup> Edn. 68 pp.
- Provancher, L. (1869) Insectes utiles. Les chrysopes. *Naturaliste Canadien (Québec)*, 1, 138–140.
- Provancher, L. (1871a) L'hémérobe. *Naturaliste Canadien (Québec)*, 3, 142.
- Provancher, L. (1871b) Liste des Névroptères pris à Québec. *Naturaliste Canadien (Québec)*, 3, 267–269.
- Provancher, L. (1877a) Troisième ordre les névroptères, Neuroptera. *Petite faune entomologique du Canada, et particulièrement de la Province de Québec*, 2, 57–157.
- Provancher, L. (l'Abbé). (1877b) Les insectes-Névroptères. *Naturaliste Canadien (Québec)*, 9, 201–205.
- Putman, W.L. (1932a) Chrysopids as a factor in the natural control of the Oriental fruit moth. *Annual Report of the Entomological Society of Ontario*, 62 (1931), 44–45.

- Putman, W.L. (1932b) Chrysopids as a factor in the natural control of the Oriental fruit moth. *The Canadian Entomologist*, 64, 121–126.
- Putman, W.L. (1937) Biological notes on the Chrysopidae. *Canadian Journal of Research*, 15 (D), 29–37.
- Putman, W.L. (1955) Bionomics of *Stethorus punctillum* Weise (Coleoptera: Coccinellidae) in Ontario. *The Canadian Entomologist*, 87, 9–33.
- Putman, W.L. (1956) Differences in susceptibility of two species of *Chrysopa* (Neuroptera: Chrysopidae) to DDT. *The Canadian Entomologist*, 88, 520.
- Putman, W.L. (1963a) The codling moth, *Carpocapsa pomonella* (L.) (Lepidoptera: Tortricidae): a review with special reference to Ontario. *Proceedings of the Entomological Society of Ontario*, 93 (1962), 22–60.
- Putman, W.L. (1963b) Nectar of peach-leaf glands as insect food. *The Canadian Entomologist*, 95, 108–109.
- Putman, W.L. & Herne, D.C. (1958) Natural control of phytophagous mites (Tetranychidae and Eriophyidae) in Ontario peach orchards. *Proceedings of the 10<sup>th</sup> International Congress of Entomology (Montreal)*, 4 (1956), 667–673.
- Putman, W.L. & Herne, D.C. (1960) Effects of sevin on phytophagous mites and predators in an Ontario peach orchard. *Canadian Journal of Plant Science*, 40, 198–201.
- Putman, W.L. & Herne, D.C. (1966) The role of predators and other biotic agents in regulating the population density of phytophagous mites in Ontario peach orchards. *The Canadian Entomologist*, 98, 808–820.
- Riegert, P.W. (1989a) *Entomologists of Alberta*. The Entomological Society of Canada, and The Entomological Society of Alberta. 56 pp.
- Riegert, P.W. (1989b) *Entomologists of Manitoba*. The Entomological Society of Canada, and The Entomological Society of Manitoba. 69 pp.
- Riegert, P.W. (1990) *Entomologists of Saskatchewan*. The Entomological Society of Canada, and The Entomological Society of Saskatchewan. 49 pp.
- Riegert, P.W. (1991) *Entomologists of British Columbia*. The Entomological Society of Canada, and The Entomological Society of British Columbia. 90 pp.
- Riotte, J.C.E. (1992) *Annotated List of Ontario Lepidoptera*. Miscellaneous Publications of the Royal Ontario Museum, Life Sciences. viii + 208 pp.
- Roble, S.M. & Flint, O.S., Jr. (2001) Five northern lacewings new to the Virginia fauna, including significant southern range extensions for *Eremochrysa canadensis* and *Hemerobius costalis* (Neuroptera: Chrysopidae, Hemerobiidae). *Banisteria*, 18, 31–34.
- Robinson, A.G. (1952) Annotated list of predators of tetranychid mites in Manitoba. *Proceedings of the Entomological Society of Ontario*, 82 (1951), 33–37.
- Rockburne, E.W. & Lafontaine, J.D. (1976) *The Cutworm Moths of Ontario and Quebec*. Canada Department of Agriculture, Research Branch, Publication 1593. 164 pp.
- Ross, W.A. (1932) History of the Oriental fruit moth infestation in the Niagara Peninsula. *Annual Report of the Entomological Society of Ontario*, 62 (1931), 40–43.
- Ross, W.A. & Putman, W.L. (1934) The economic insect fauna of Niagara peach orchards. *Annual Report of the Entomological Society of Ontario*, 64 (1933), 36–41.
- Rubinoff, D. & Holland, B.S. (2005) Between two extremes: mitochondrial DNA is neither the panacea nor the nemesis of phylogenetic and taxonomic inference. *Systematic Biology*, 54, 952–961.
- Saunders, W. (1875) List of Neuroptera collected chiefly in the neighbourhood of London, Ont. *The Canadian Entomologist*, 7, 152–154.
- Schneider, G.T. (1851) *Symbolae ad Monographiam Generis Chrysopae*, Leach. Vratislaviae. 178 pp., pl. 1–60.
- Scopoli, J.A. (1763) *Entomologia Carniolica*. J.T. Trattner, Vindobonae.
- Scudder, G.G.E. (1979) Present patterns in the fauna and flora of Canada. In: Danks, H.V. (Ed.). *Canada and its insect fauna. Memoirs of the Entomological Society of Canada*, 108, 87–179.
- Scudder, G.G.E. (1994) An annotated systematic list of the potentially rare and endangered freshwater and terrestrial invertebrates in British Columbia. *Occasional Papers of the Entomological Society of British Columbia*, 2, 1–92.
- Séméria, Y. (1977) Discussion de la validité taxonomique du sous-genre *Chrysoperla* Steinmann (Planipennia, Chrysopidae). *Nouvelle Revue d'Entomologie*, 7, 235–238.
- Séméria, Y. & Nel, A. (1990) *Paleochrysa monteilsensis* gen. et sp. nov., a new fossil of Chrysopidae from the Upper Eocene formation of Monteils (France), with a review of known chrysopid fossils (Insecta: Neuroptera). In: Mansell, M.W. & Aspöck, H. (Eds.). *Advances in Neuropterology, Proceedings of the 3<sup>rd</sup> International Symposium on Neuropterology*. South African Department of Agricultural Development, Pretoria S.A., 27–32.
- Sheldon, J.K. & MacLeod, E.G. (1971) Studies on the biology of the Chrysopidae. II. The feeding behavior of the adult of *Chrysopa carnea* (Neuroptera). *Psyche*, 78, 107–121.
- Smith, R.C. (1922) The biology of the Chrysopidae. *Memoirs of the Cornell University Agricultural Experiment Station*, 58, 1287–1372, pl. 55–58.
- Smith, R.C. (1932) The Chrysopidae (Neuroptera) of Canada. *Annals of the Entomological Society of America*, 25, 579–601.
- Spencer, G.J. (1942) A preliminary list of the Neuroptera of British Columbia. *Proceedings of the Entomological Society of British Columbia*, 38 (1941), 23–28.
- Steenburgh, W.E. (1931) The biological control factors affecting the abundance of the Oriental fruit moth (*Laspeyresia molesta* Busck) in Ontario during 1930. *Annual Report of the Entomological Society of Ontario*, 61 (1930), 57–65.



- Steinmann, H. (1964) The *Chrysopa* species (Neuroptera) of Hungary. *Annales Historico-Naturales Musei Nationales Hungarici*, 56, 257–266.
- Stephens, J.F. (1836) *Illustrations of British Entomology. Mandibulata*, 6. London.
- Tauber, C.A. (1969) Taxonomy and biology of the lacewing genus *Meleoma* (Neuroptera: Chrysopidae). *University of California Publications in Entomology*, 58, 1–94.
- Tauber, C.A. (1974) Systematics of North American chrysopid larvae: *Chrysopa carnea* group (Neuroptera). *The Canadian Entomologist*, 106, 1133–1153.
- Tauber, C.A. (2003) Generic characteristics of *Chrysopodes* (Neuroptera: Chrysopidae), with new larval descriptions and a review of species from the United States and Canada. *Annals of the Entomological Society of America*, 96, 472–490.
- Tauber, C.A. & Tauber, M.J. (1973) Diversification and secondary intergradation of two *Chrysopa carnea* strains (Neuroptera: Chrysopidae). *The Canadian Entomologist*, 105, 1153–1167.
- Tauber, C.A. & Tauber, M.J. (1982) Evolution of seasonal adaptations and life history traits in *Chrysopa*: response to diverse selective pressures. In: Dingle, H. & Hegmann, J.P. (Eds.), *Evolution and Genetics of Life Histories*. Springer-Verlag, New York, 51–72.
- Tauber, C.A., Tauber, M.J., & Milbrath, L.R. (1995) Individual repeatability and geographical variation in the larval behaviour of the generalist predator, *Chrysopa quadripunctata*. *Animal Behaviour*, 50, 1391–1403.
- Tauber, C.A., León, T.de, López-Arroyo, J.I., & Tauber, M.J. (1998) *Ceraeochrysa placita* (Neuroptera: Chrysopidae): generic characteristics of larvae, larval descriptions, and life-cycle. *Annals of the Entomological Society of America*, 91, 608–618.
- Tauber, C.A., León, T.de, Penny, N.D., & Tauber, M.J. (2000) The genus *Ceraeochrysa* (Neuroptera: Chrysopidae) of America north of Mexico: larvae, adults, and comparative biology. *Annals of the Entomological Society of America*, 93, 1195–1221.
- Tauber, M.J. & Tauber, C.A. (1974) Thermal accumulations, diapause, and oviposition in a conifer-inhabiting predator, *Chrysopa harrisii* (Neuroptera). *The Canadian Entomologist*, 106, 969–978.
- Throne, A.L. (1971) The Neuroptera-suborder Planipennia of Wisconsin. Part 1. Introduction and Chrysopidae. *Michigan Entomologist*, 4, 65–78.
- Tjeder, B. (1952) *Specimina typorum insectorum a Carolo Linnaeo descriptorum in Museo Degeeriano asservata*. *Entomologisk Tidsskrift*, 73, 203–206.
- Tjeder, B. (1960) Neuroptera from Newfoundland, Miquelon, and Labrador. *Opuscula Entomologica*, 25, 146–149.
- Tjeder, B. (1966) Chapter II. Neuroptera-Planipennia. The Lace-wings of Southern Africa. 5. Family Chrysopidae. In: Hanström, B., Brinck, P., & Rudebeck, G. (Eds.), *South African Animal Life*, 12, 228–534.
- Toschi, C.A. (1965) The taxonomy, life histories, and mating behavior of the green lacewings of Strawberry Canyon (Neuroptera: Chrysopidae). *Hilgardia*, 36 (11), 391–431, Appendix.
- Walker, F. (1853) *List of the Specimens of Neuropterous Insects in the Collection of the British Museum. Part II. (Sialidae - Nemopterides)*. Introduction by J.E. Gray. Printed by Edward Newman, Bishopsgate, London. [Short Title: *Neuroptera in British Museum*], Part II, 193–476.
- Watson, T.K. & Wilde, W.H.A. (1963) Laboratory and field observations of the pear psylla in British Columbia. *The Canadian Entomologist*, 95, 435–438.
- Webb, F.E. (1964) A history of forest entomology in Manitoba. *Proceedings of the Entomological Society of Manitoba*, 19 (1963), 12–24.
- Westigard, P.H., Gentner, L.G., & Berry, D.W. (1968) Present status of biological control of the pear psylla in southern Oregon. *Journal of Economic Entomology*, 61, 740–743.
- Wiersema, J.H. & León, B. (1999) *World Economic Plants*. A Standard Reference. CRC Press, Boca Raton, London, New York, Washington DC. 749 pp.
- Wheeler, T.A., Huber, J.T., & Currie, D.C. (2001) Label data standards for terrestrial arthropods. *Biological Survey of Canada (Terrestrial Arthropods). Document Series*, 8, 1–20.
- Wilde, W.H.A. (1962) Bionomics of the pear psylla, *Psylla pyricola* Foerster in pear orchards of the Kootenay Valley of British Columbia, 1960. *The Canadian Entomologist*, 94, 845–849.
- Wilde, W.H.A. (1963) Hyperpredators of the pear psylla, *Psylla pyricola* Foerster (Homoptera: Chermidae). *Proceedings of the Entomological Society of British Columbia*, 60, 48–49.
- Wilde, W.H.A. & Watson, T.K. (1963) Bionomics of the pear psylla, *Psylla pyricola* Foerster, in the Okanagan Valley of British Columbia. *Canadian Journal of Zoology*, 41, 953–961.
- Winterton, S. & Freitas, S.de. (2006) Molecular phylogeny of the green lacewings (Neuroptera: Chrysopidae). *Australian Journal of Entomology*, 45, 235–243.
- Yang, X.K. (1991) *Dichochrysa* nom. nov. for *Navasius* Yang and Yang 1990 (Neuroptera: Chrysopidae) nec Esben-Petersen 1936 (Neuroptera: Myrmeleontidae). In: Zhang, G. (Ed.), *Scientific Treatise on the Systematic and Evolutionary Zoology*, 1, 150.
- Yang, X.K. & Yang, C.K. (1990) *Navasius*, a new genus of Chrysopinae (I) (Neuroptera: Chrysopidae). *Acta Zootaxonomica Sinica*, 15, 327–338.